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ABSTRACT

The present report is the result of the study on human resources and educational planning carried out in 1964 by the National Planning Institute (INP) in co-operation with the Organization for Economic Co-operation and Development. The main purpose of the report is to help integrate Peru's educational development and process of general development. New paths for analyzing the country's educational problems is another aim of the Development Plan. Long term forecasts (1980) were made of manpower requirements and their consequences on educational development. The stages of the study are as follows: Chapter I summarizes the main results of the study; Chapter II reviews the educational situation in Peru over the past ten years and suggests the main lines of strategy for developing the educational system; Chapter III translates targets of economic development up to 1980 into manpower requirements according to level the type of education; Chapter IV forecasts development of the educational system needed to satisfy the economy's manpower requirements and to meet other important social and cultural purposes. Methods used and future studies are indicated. The report contains a body of data designed for the encouragement of development planning through further studies and response to circulation of the report. A related document is ED 012 240. (Author/SJM)

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HUMAN RESOURCES,
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ECONOMIC DEVELOPMENT

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HUMAN RESOURCES, EDUCATION AND ECONOMIC DEVELOPMENT IN PERU

FORECASTS OF MANPOWER REQUIREMENTS IN 1980 AND OF EDUCATIONAL DEVELOPMENT PROSPECTS

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

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The members of OECD are Austria, Belgium, Canada, Denmark, Finland, France, the Federal Republic of Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States.

The Directorate for Scientific Affairs, which is responsible for the publication of the present report, has been established within OECD to take charge of the activities of the Organisation relating to science policy and research and to the expansion and rational utilisation of the scientific and technical personnel available so as to meet the needs arising from economic growth.

The Mediterranean Regional Project consisted of a joint programme undertaken by countries in Southern Europe (Greece, Italy, Portugal, Spain, Turkey and Yugoslavia) to prepare for governments an assessment of their educational needs up to 1975 and to arrive at detailed plans, including financial estimates, for meeting these needs. The Project was initiated by bilateral agreements between the OECD and the participating countries. The expenditure involved is shared.

The OECD Secretariat's share of the work consisted of research in co-operation with national teams of experts, consultation, the training of research workers and the preparation and publication of methodological documents and national reports.

A grant from the Ford Foundation has made it possible to apply to other developing countries the experience acquired in the planning of human resources. It was under this programme that the pilot scheme was carried out for the long-term forecasting of manpower requirements and educational aims in Peru; this publication consists of the final report on this experiment.

OECD's Development Centre, which co-operated with the Directorate for Scientific Affairs in the carrying out of this programme, was set up in 1962. Its task is to assemble the available knowledge and experience of participating countries concerning both economic development and the drawing up and carrying out of general economic policies, to adapt this knowledge and experience to the actual needs of developing countries or regions and, by the appropriate means, make it available to the countries concerned.

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PREFACE

This study, which is the result of a systematic experiment of the Peru National Planning Institute on the planning of human resources, was prepared in collaboration with the OECD under a programme for the transfer of experience, financed by the Ford Foundation.

The methods of this co-operation, the successive stages in the work undertaken or still to be accomplished are analysed in the introduction to the report, written by the Peruvian authorities for the Spanish edition and reproduced in full.

The Peruvian version includes a number of annexes, mainly consisting of statistical tables on education, which are not given in the international version published in French and English by the OECD. The systematic assembly and analysis of all the information available on the Peruvian educational system has obviously represented an important part of the work of the human resources sector of the National Planning Institute, and is an essential basis of the report. Most of these data have been embodied in the text of the present report in a more summary form. Research workers wishing to consult the original data may therefore refer to the Peruvian version in Spanish published by the Peruvian authorities.

In the Introduction to the Technical Evaluation of the First Stage of the Mediterranean Regional Project - which was the first work published in this special programme series of the OECD Scientific Affairs Directorate - it has already been explained how this programme for co-operation with the Peru National Planning Institute has helped both theoretically and practically to enrich the experience of the OECD in the planning of education and human resources.

This report is based on methods already tried out by the OECD in the Mediterranean Regional Project and shows the adjustments needed to allow for the differences in economic and social environment.

We are most grateful to the Peruvian authorities for all the support they have given, at the highest level, to this undertaking from the outset and which has made it possible to prepare, and to obtain official approval for, this report.

J.R. GASS,
Deputy Director,
Directorate for Scientific Affairs

FOREWORD(1)

The present report is the result of the study on human resource and educational planning carried out in 1964 by the National Planning Institure (INP) in co-operation with the Organisation for Economic Co-operation and Development (OECD) under the technical assistance programme set up by these two institutions with a grant from the Ford Foundation. The main purpose of this programme was to take the economic and social development targets of Peru as a basis for long-term (quantitative and qualitative) forecasts (1980) of human resources and the corresponding educational requirements, which would serve as a foundation for a policy of planned educational development. The initial point of departure was the experience gained by the OECD with similar studies carried out previously in the Mediterranean Regional Project countries; another study of the same kind was made in 1965 by the Argentine Government in co-operation with the OECD.

In March 1965, a large number of experts from Latin America, OECD Member countries and international organisations met in Lima for the Seminar on Long-term Manpower Requirements Forecasting and Educational Policies, held under INP and OECD auspices, and thoroughly discussed the possibility of linking economic and social development targets with human resource and educational planning. The Peruvian participants informed the other participants at the Seminar of the general methods and main surveys planned in preparation for the present report.

The study itself lasted throughout 1965 at the National Planning Institute. The Directorate of Sector Planning has a Bureau of Educational Planning under Professor Carlos Malpica Faustor, who collaborated with Dr. Fred W. Scholten, Economist in the OECD

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(1) This is the translation of the foreword to the revised edition of the report presented by the Peruvian authorities to the Conference of Ministers of Education of Latin America at Buenos Aires in June 1966.

Directorate for Scientific Affairs.

Dr James V. Cornehls, Economist on the University of Columbia Teachers College Mission, was associated with the work right from the preparatory stage. In July 1965, the team was joined by two specialists from the Ministry of Education, Professor Moises Acuna Diaz and Professor Juan Chong Sanchez, advisors on education and teaching methods, and by Professor Delia Ramon Cordova, specialist in higher education. In addition, Dr. Jean-Pierre Jallade, OECD economist, took part in one stage of the study.

Several officials and experts gave their help for various parts of the work; special thanks are due to Professor Gustavo Bastarrachea Garcia, Head of the Educational Statistics Division in the Ministry of Education, Mr. Fernando Planas Underwood, of the Employment and Human Resources Department in the Ministry of Labour, and Mr. Rafael Estartus, Engineer, of the IBM Company of Peru. We should also like to mention those who helped draft, revise and publish the report, and in particular Mrs. Carmen Iraola de Camacho, Secretary of the INP Bureau of Educational Planning.

The settlement of administrative problems at each stage of the programme and access to important sources of information were facilitated by Mr. Carlos Pestana Zevallos, Head of the INP, and Mr. Armando Dam Rosell, Engineer, Technical Director of the INP, together with Mr. Victor Raul Montesinos Vasallo, Engineer, Director of Sector Planning, the Ministers of Education:
Mr. José Navarro Grau, Engineer, and Dr. Carlos Cueto Fernandini, Mr. Numa Leon de Vivero, Engineer, Director of Statistics and the Census, Mr. Giovani De Francheschi, official in the same Office, and Dr. Michel Debeauvais, of the OECD.

The organisations which gave constant encouragement to the preparatory work for the report which said that they were interested in taking part in the next stage of implementation include the Inter-University Council under Dr. Mauricio San Martin, at that time Rector of the National University of San Marco, the Ford Foundation Office in Peru, represented by Dr. Peter A. Fraenkel, the University of Columbia Teachers College Mission in Peru, directed by Dr. Ralph R. Fields and Dr. Sidney R. Grant, the Employment and Human Resources Department directed by Dr. Alberto Insua Garbarino, the Commission responsible for advising the Education and Human Resources Section with regard to the preparation of the Economic and Social Development

Plan for 1967-1970, which is chaired by Dr. Carlos Cueto Fernandini, with Professor Gerardo Ayzanoa del Carpio as Executive Secretary, and its three Sub-Commissions on Schools, Universities and Human Resources, whose respective Chairmen are Dr. Carlos Salazar Romero, Dr. Mauricio San Martin and Dr. Alberto Insua Garbarino, with Dr. Rolando Chacon Olivos, Dr. Carlos Cuadros Negreiros and Dr. Benjamin Samamé Pachecho as Secretaries-General.

Lastly, special mention should be made of the help given by Dr. Carlos Cueto Fernandini, Minister of Education and Chairman of the Commission on Education and Human Resources for the Economic and Social Development Plan for 1967-1970, in preparing this revised edition of the report; we were able thanks to him to use his Commission's conclusions for a complete revision of Chapter II, and his help was valuable when preparing Chapter I, which specifies the scope of the study, its main results and further tasks now to be put in hand for preparing educational development plans. In addition, the Ministry of Education has made a financial contribution towards the publication of this second revised edition of the report.

Thanks to all this help, the National Planning Institute now has in its possession a basic sector study which represents a considerable advance for Peru in educational planning and a useful aid to all INP departments, which are now working on the country's First Economic and Social Development Plan.

We should like to convey our profound thanks to the OECD for its valuable co-operation and for the success of this programme, which we hope will continue and be extended in the future.

Chapter I

MAIN RESULTS OBTAINED

Immediately after subscribing to the Punta del Este Charter, Peru began in August 1961 to plan its economic and social development by first setting up a body for interministerial co-ordination, the Central Research and Programmes Office of the Ministry for Finance and Trade; a national planning scheme was introduced in October 1962 under the President of the Republic, comprising a National Development Council and a National Planning Institute. Since then, the scheme has been gradually extended with the creation of Directorates for economic sectors, regional Directorates and an Advisory Council on Planning which includes representatives of the private sector; the studies carried out have been circulated in all government departments and brought to the attention of all sectors of opinion; the INP has also trained experts and has benefited from international co-operation.

Its most important results include: a review of the country's economic and social situation, which has been brought up to date annually ever since the first report published in June 1963; public investment planning in 1964-1965 and 1966; economic studies on major investment programmes, and preparatory work for the Economic and Social Development Plan for 1967-1970.

As soon as the constitutional Government of Peru came into power in July 1963, it decided to give priority in its programme to a new stimulus for the country's development planning; it therefore increased the administration's means of action, aroused the private sector's interest in the achievement of national targets, made an exhaustive review of the country's economic and social situation and began the stage-by-stage preparation of the country's First General Development Plan. By the time it comes to the end of its term of office in July 1969, the present régime will have put the country on the path towards planned development, leaving a prospective programme for 1970.

We should also mention the considerable methodological advances made in adjusting planning techniques to the special conditions reigning in Peru. In this respect, the present report constitutes one of the basic studies for improving the integration of educational planning with planning in general.

The methods used in the report are based on those worked out by the OECD over the past five years and which have already been put into practice under the Mediterranean Regional Project, where long-term forecasts were made of manpower requirements and their consequences on educational development in six European countries. The Working Party set up in Peru to prepare the present report thus defined its aim as being to prepare a long-term general forecast, mainly from the economic viewpoint - in other words, the kind of study which would be carried out by a Central Planning Office. At the same time, the Government set up a Commission on Education and Human Resources for the Economic and Social Development Plan with three Sub-Commissions respectively on schools in the Ministry of Education, universities in the Inter-University Council and human resources in the Employment and Human Resources Department. This Commission has contributed towards the revised edition of the present report by reviewing the educational system and preparing working documents on the aims, strategy and policy of education; it has now been instructed to continue these studies and, in the context of this strategy, to define the aims of educational policy for approval by the National Development Council; it will also have to propose procedures and methods for achieving the targets fixed, specifying what these are at sector and regional level, and indicating individual short-and medium-term projects.

It should be pointed out that the main purpose of the report is to try and integrate educational development with the country's general process of development, a task which has often been formulated and suggested but not as yet extensively carried out in the

Latin American countries. This aim is all the more important as the educational system influences both the economic and social aspects of development; in addition, this report represents an advance in planning in one of the sectors referred to as "social" which usually appear only in annex to development programmes and are not related to the Plan's general forecasts and targets except as regards their budgetary implications.

The authors of the report are the first to point out that the study is not final but, on the contrary, opens new paths for analysing the country's educational problems, facilitating the dialogue between the responsible leaders and the authorities, and the adopting of an educational policy which is the joint achievement of all citizens. This is moreover one of the aims of the Development Plan and the report makes a positive contribution towards that aim. We are all more or less aware of the overwhelming tasks which fall to education, especially when we consider the contribution it has to make towards national development. We need think for example, only of the exceptional solutions which education is often expected to provide for the country's problems with the modest means at its disposal. In any event, there can be no denying that education can and must make an effective contribution towards development. But what can it be expected to do? How can it do it? Questions of this sort can be answered only after public debate, which should be as wide as possible.

Our times are marked by extraordinary advances in science and technology and by the ever closer interdependence of countries, while at the same time the population growth of individual countries is an explosive phenomenon and has a structure and regional distribution which are very adverse factors; the geography of Peru presents many difficulties and the country is largely unexplored and unconquered; we are endeavouring at one and the same time to speed up the process of integrating the Indians as well as local mobility, and to consolidate the new democracy and strengthen the local powers which have been given back to the people through direct municipal elections; all of this forms part of an overall effort to introduce a systematic policy of planned development into the country. What consequences does this have for the conditions governing the development and targets of Peruvian education? This question must be asked before formulating an educational policy if we want the latter to take a definite realistic direction.

The stages of the study are as follows:

Chapter II reviews the educational situation in Peru over the past ten years and suggests the main lines of a strategy for developing the educational system; Chapter III translates the targets of economic development up to 1980 into manpower requirements according to level and type of education; Chapter IV forecasts the development of the educational system needed to satisfy the economy's manpower requirements and for other important social and cultural purposes. In view of the nature of the study, care has been taken in all cases to detail the methods used and indicate the studies which should be carried out later. We have also tried to assess the respective importance of the various factors in the country's evolution. Many annexes are added(1) which might be used for research on educational problems in Peru.

Chapter II contains an exhaustive critical analysis of the main Peruvian educational problems, with special reference to the period 1955-1964. We have not tried particularly to highlight the satisfactory aspects of the educational system, nor the positive features revealed during the past few years by the increase in the number of pupils, teachers, schools, etc. This explains the severity of the report's judgment when pointing out the disequilibria resulting from the educational system's uncontrolled expansion; there can be no doubt that this criticism is constructive as it is responsible for the solutions proposed in subsequent Chapters and for the forecasts they contain. Perhaps the newest element appears at university level, since the report's diagnosis and the participation of the Inter-University-Council in this review provide for the first time an overall study of the Peruvian Universities' serious inability to meet the present rapid rise in the number of students.

In Chapter III, it should be noted that short-, medium- and long-term macro-economic forecasts will shortly be made in connection with the Economic and Social Development Plan for 1967-1970, which constitutes a new factor; it was not therefore considered advisable to expound on several different alternatives in the report.

At the same time, this study will help prepare sector studies on human resources, the first of which, on agriculture, has just been published as a working document; it will be possible by this means to move on to a more analytical stage with forecasts by sector, sub-sector, branch of industry, project and strategically important occupations; it will also be possible to carry out similar studies for social and economic areas as part of the regional studies envisaged by the National Planning Institute.

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(1) Only some of these are reproduced in the French and English editions (Translator's note).

Chapter IV deduces the educational system's development prospects from the forecasts made in the preceding chapter, while adding certain social targets such as the general spread of primary education. It should be noted here, as mentioned on several occasions in the report, that neither Chapter IV nor the study as a whole pretends to constitute an educational plan; they nonetheless represent an important step towards the preparation of such a plan on condition that they are followed by the stages referred to in the rest of the report. It should also be pointed out that the purpose of the plans themselves is not to predict exactly what is going to happen but to facilitate the co-ordination of economic and social policies in the light of national long-term targets.

The surveys and preparation of the report took the whole of 1965 and the first preliminary edition was published in December of that year. During the first half of 1966, the Commission on Education and Human Resources completed its diagnosis of the educational system in consultation with the National Planning Institute, and held meetings with the responsible authorities and experts on education to discuss the provisional text of the report and its conclusions; Chapter II was then completely revised, the financial aspects were further analysed and several amendments made to Chapter III and IV, allowing also for the recommendations of a special OECD mission. At the same time, the Commission submitted a document on "Education: targets, strategy and policies" to the National Planning Institute, which is now examining it together with similar reports on other economic and social sectors before presenting them to the National Development Council.

It may be useful to mention in this introduction some of the report's most important results in order to invite study and criticism. The "demographic challenge" to be met in the development of Peru has often been mentioned by the President of the Republic, Fernando Belaunde Terry, and must be resolutely faced by the country's planners as an accepted fact, even from the long-term point of view. Two points illustrate this assertion: all those who will form the country's working population in 1980, the last year covered by the report's forecasts, have already been born; secondly, the report predicts that education will be provided for all children of 8 years of age in 1975, i.e. it is assumed that schooling will be guaranteed for all youngsters born during the first year of implementing the 1967-1970 Development Plan. The following figures give a better idea of the extent of the effort to be made: in order to obtain a satisfactory level of employment, the number of jobs will have to rise from 3,120,800 in 1964 to 5,824,700 in 1980, i.e. an average of 142,000 new jobs each year. At the same time, the total school population enrolled at all levels of education (preschool, primary, secondary, "intermediate" and higher) should rise from 2,220,100 in 1964 to 4,918,100 in 1980, i.e. an additional 168,600 on average each year.

"Rate of survival" is another important factor when analysing the long-term situation. Of the 5,824,700 workers forecast for 1980, 2,068,500 will be "survivors" of the 1961 working population, i.e. a rate of survival of 35.5 per cent, the remainder consisting of newcomers to the employment market. These proportions are generally the other way round in the more advanced countries for comparable periods. Similarly, of the 142,460 teachers forecast for 1980, only 22.5 per cent were already employed in 1961. In other words, the present vocational training programme - especially in the teaching field - will in the long term affect the characteristics of the labour force owing to the country's rapid expansion over the next 15 years in the fields of employment and education.

The production forecasts assume a considerable constant rate of growth; this will be difficult to achieve in the long-term, especially as regards investment, but it is indispensable to do so if the Peruvian population is to be given the opportunity if raising its standard of living. This target is moreover linked with the financial effort involved in the forecast of educational development for 1975, which is estimated as 7 per cent of gross domestic product or 10,239,300,000 sols (at 1960 prices) for total expenditure on education. By 1965, this financial effort already corresponded to 5.7 per cent of gross domestic product at 4,311,000,000 sols (at 1960 prices). This information begs the question of the economic feasibility of financing such an educational and human resource development programme, which means that it is absolutely vital to make more effective use of the considerable economic resources devoted to education and also points to the decisive role that could be played by external sources of financial assistance and long-term internal financing procedures. This latter aspect is of special importance when we consider that the level of the financial effort envisaged for 1975 assumes that deficiencies in the educational infrastructure will have been made up in the meantime and that the necessary material means will be available for meeting the rapid rise in school enrolment figures. The Commission on Education and Human Resources will have to go further into these problems than we have chosen to in the present short description.

The report also emphasizes the crucial importance of productivity. Thus, the population of working age is increasing rapidly; however, it accounts for a fairly small proportion of the total population and its average level of education is at present very low; the development plan must guarantee this population a sufficient number of jobs. In these circumstances, the social target of maintaining a satisfactory level of employment and the economic target of raising productivity in new firms may be incompatible and impede the implementation of the national plan and even entail serious social conflict. Further studies will therefore have to be carried out on productivity since - as we have seen - it must play a decisive role in economic and social development policy.

In the field of educational development, the structure of the school population will be quite different in 15 years' time and the differences should be itemised before suggesting any sector strategy such as that described at the end of Chapter II. Thus, the annual rate of increase in school enrolment figures between 1964 and 1980 is 4.7 per cent for nursery and primary schools, 7 per cent for secondary schools, 17.9 per cent for the "intermediate" level and 4.3 per cent for higher education. This shows the capital importance which will be assumed by secondary education, where the most serious structural defects are to be found at the same time as the highest rate of increase in enrolment. In view of the methods employed and the assumptions made regarding increased rates of academic passes, it is the school-leaving targets which must express the type and extent of the educational effort that will have to be made in order to contribute effectively towards economic and social development. The following table compares the number of school leavers and graduates forecast for the two decades covered.

LEVEL OF EDUCATION	TOTAL NUMBER OF SCHOOL LEAVERS AND GRADUATES	
	1961-1970 (a)	1971-1980
Primary Education	1,600,000	3,982,400
Secondary Education	381,000	944,300
Intermediate Education	2,100	12,900
Higher Education	102,100	160,500

(a) According to the number of pupils and students already enrolled.

At primary level, the study shows that it is possible in the medium-term for education to become general throughout the country, although attention should be drawn to the deterioration in teaching standards over the past few years and to the need to raise educational output appreciably. Since 50 per cent of primary school teachers have never received any teacher training, and those who have tend to concentrate in urban areas, priority should obviously be given to the organisation of efficient school inspection services, while at the same time recommending greater powers for the local authorities in order to guarantee and facilitate the equipment and operation of the educational service.

At secondary level, the most important task will probably be to reform the present structure, which is split up already at lower level into a great number of branches and types of school. Pupils are therefore obliged to make their choice prematurely without previously taking their bearings. This leads regrettably to a restricted choice and to economic inefficiency, which are reflected in the jobs taken by secondary school leavers.

This structural reform will necessitate a resolutely progressive educational policy, as the present economic situation in Peru has special features which will raise many problems for those whose delicate task will be to find the appropriate means of adapting pupils' qualifications to the country's economic and social requirements. Should a lower basic level be introduced which would be common to all secondary schools, with longer general education and a shorter vocational upper level? Is it possible to standardize secondary education only by creating a new type of standard shool? How can the necessary unity be obtained without sacrificing the indispensable diversity of vocational training? Is it possible to offer a varied curriculum already in the first year of secondary school without interfering with general education? These are only some of the questions which will have to be answered before reforming the structure of secondary education and working out new curricula.

At the very recently created "intermediate" level, which is of crucial importance for economic development, the forecasts are necessarily tied up with higher education and the regional social and economic plans, so that the appropriate specialisation and division of labour between intermediate and higher educational establishments are obtained for each region. The curricula for these two levels have the highest unit costs and require the most qualified teaching staff. The forecasts for the intermediate level must therefore be very detailed and clearly specify the opportunities offered in each career, as otherwise there will either be bottlenecks because of the shortage of new graduates - which would oblige the country to import foreign labour - or else a surplus of highly skilled personnel which would have to emigrate. We have emphasized these dangers because in the present circumstances the direction taken by higher education is strongly influenced by extra-economic reasons. For instance, in some extreme cases the requirements forecast are not even taken into account as, for example, in teacher training, which one would logically assume would depend on the requirements of the educational system.

In our opinion, the time is ripe for determining and adopting new directions for the subsequent development of Peruvian education; the structure of the educational system should be reformed to bring it more into line with the country's requirements; its quality and productivity should be improved and it should be co-ordinated with extra-curricular training activities; its growth should be regulated in accordance with the requirements forecast by the Plan, while school administration should be technically improved and decentralised with a view to making it more efficient and to facilitating the implementation of the forecasts made in the present study. This could serve as a point of departure for later work in these various fields by the Commission on Education and Human Resources.

The study could thus be used by the educational authorities, on the one hand, whose job is to define educational policy, and on the other by both trade and teachers' associations, which have to co-operate with the State in order to solve the problems raised by education in Peru, by parent's associations, which should naturally assist the country in the educational field, by the other sectors of the Plan, which will be called on to carry out detailed studies on the labour situation in each sector, by businessmen, who will have to consider the importance of the investment actually represented by the expansion of training facilities in harmony with the requirements of economic development, by parliamentarians, who want better co-ordination of State action in the training field and to provide the educational system with the financial and material means necessary for carrying out the plans, by the Principals of Teacher Training Colleges whishing to provide their students with a better preparation for their role as teachers and to increase teaching research in Peru and, lastly, by International Organisations in order to help them orientate their technical and financial co-operation programmes and get a better idea of the difficulties faced by Peru in solving its educational problems.

The Commission on Education and Human Resources intends to give the widest circulation to the present study in the context of the Economic and Social Development Plan (1967-1970) with a view to encouraging examination and discussion of its conclusions, arousing the interest of public opinion in the fundamental problems of education and stimulating the very urgent research referred to throughout the study, especially on occupational mobility, underemployment, vacancies due to death and retirement, productivity, educational profiles for the main occupational categories, the renovation and standardization of the educational service, standardization of costs, introduction of new teaching methods, etc. As soon as the National Development Council has approved the document defining educational policy, the Commission will begin to prepare the draft reform of the structure of Peruvian education and to fix specific short- and medium-term targets for the various levels of education, by region and by project, while at the same time proposing the institutional and administrative reforms required in order to attain them. Projects of strategic importance will be gradually put in hand throughout the country, and first of all in pilot areas, so that it will be possible to acquire a certain experience, to try out new methods and to obtain the effect of example which could play a multiplying role in their respective areas of influence. Development planning in fact requires great discipline in the implementation of measures once they have been decided on, and this discipline is particularly decisive in the educational sector, where, as demonstrated in the chapter critically reviewing the situation, a complex set of factors has had the effect of completely distorting the evolution of the educational system, even though the State itself administers the major part of that system.

Lastly, it should be noted that the problems analysed in the present study are similar to those which at present characterise the general development of education in Latin America, with different shades of intensity according to the country, as revealed by the extensive regional surveys carried out over the past ten years or so, in particular by experts from the international organisations. Thanks to these organisations' discussion of educational problems it has been possible to draw conclusions from these surveys which have resulted in important recommendations with a view to orientating the efforts deployed by States in planning educational development. Fortunately, this revised edition of the report was completed shortly before the meeting of Ministers of Education and Economic Planning in the Latin American and Caribbean area countries. This meeting was organised jointly by UNESCO and CEPAL from 20th to 30th June 1966 in Buenos Aires and gave Peru the opportunity of taking part in a very important international forum. The OECD, for its part, is to publish the report in French and English, thus giving it a wider circulation which will help to continue and improve the Peruvian authorities' efforts in this particular field of planning, since its publication will enable them to receive criticisms and suggestions from the ever increasing number of institutions and persons who are concerned with this important new field of development planning.

Chapter 2

SITUATION OF THE SCHOOLS IN PERU AND STRATEGY FOR EDUCATIONAL DEVELOPMENT

An attempt will be made in this chapter to indentify and analyse the chief obstacles holding up educational development in Peru and preventing it from making an effective contribution to economic and social progress. On the basis of this analysis a general strategy will be evolved for the planning of Peruvian education.

A review of the Peruvian educational system brings out the growth recorded over the past ten years or so in respect of: the facilities afforded to the population at large; the results achieved and the resources created; the social effects; the institutional framework within which this growth has taken place, and the financial effort that has been made.

To appreciate at its true value the development of educational services, these have to be regarded as a productive activity just as much as any other form of economic and social growth. No longer should we think of the school as simply a public institution into which the greatest possible number of children and adolescents must be packed for as long a period as possible, because it is socially desirable, by utilising readily available resources of manpower and finance to offer them services of a purely instructional character and confined to the normal period of school life. This description is possibly exaggerated but undeniably in some aspects still fits a large proportion of the educational system; the ideal of the new school has not yet materialised.

We shall therefore analyse the Peruvian educational system as a genuine undertaking for economic output, integrated into a socio-economic context by which it is conditioned and which, in turn, it seeks to influence. It is an economic activity providing a certain volume of services by way of contribution to economic and social development; competitively with other sectors, it is a consumer of manpower and financial resources, it exerts an action in depth on society, is deployed within a particular institutional framework and is a considerable drain on the national exchequer.

We are aware at the outset that the system is a complex one, that the sources of information concerning it are not as complete as is desirable, and that it manifests all the symptoms generally associated with rapid growth but devoid of any kind of planning.

Hence the effect of this analysis will be to propose a planned strategy for educational development relying on forecasts (Chapter 3) and quantified projections (Chapter 4), supplemented by a number of steps which the Board of Education and Manpower will have to take in accordance with the economic and social development plan now being prepared for 1967-1970.

2.1. Economic aspects

2.1.1. Educational standard and training of graduates

2.1.1.1. Demographic growth

The annual growth rate of the total population, which is constantly expanding in Peru, is exceedingly high. Whereas in 1955-1960 it was on average 2.7 per cent, it rose to 3 per cent in 1960-1965 and 3.1 per cent in 1965.

A glance at the age structure of the population shows a bulge in the youngest age groups. In 1961, 43 per cent of the population was under 15 years old. It is estimated that the group aged between five and 24 years, which accounted for 44.0 per cent of the total population in 1955, had risen to 45 per cent in 1965. Within this group the proportion of children between the ages of five and 14 rose from 26 to 27.1 per cent. The highest rate of growth was recorded in the age group five to nine, with an annual rate of 4.1 per cent between 1960-1965.

This heavy demographic pressure was a big factor in the increased demand for educational services; there was in addition a disorderly drift of the rural population into the towns, especially into the urban agglomeration of Lima, a third of whose population consists of immigrants and which also takes half the emigrants from other districts in the country. Besides sending up the demand for schooling, this population structure means that the employable age group is abnormally small and has to bear a heavy financial burden by reason of the number of young people on whom essential services, particularly education, have to be lavished.

2.1.1.2. Educational standards of the population at large

The 1961 census revealed the extremely low educational standard of the population aged seven and over whose period of schooling averaged 2.9 years. This seriously restricts the country's growth prospects. Disregarding the present school population, we find that the average school life for the population as a whole is not more than 2.8 years. However, this is not to say that nothing is being done at all and if we disregard those individuals who, by their own account, have never had any schooling, the average school life is 4.8 years. All the same, this is still below the minimum statutory school attendance of six years as laid down by law. Of the population aged four and over covered by the census, 45.8 per cent had never had any schooling, 33.9 per cent had completed the primary stage and 3 per cent the secondary stage of education; the proportion of the population having had some form of higher education was 0.8 per cent; 0.3 per cent had equivalent training elsewhere. Diag. 2.01, representing the population pyramid according to the educational standard achieved, shows the commonest school leaving age at each different stage. In the primary stage very many children leave school in their second year due to the retention of the old "elementary schools" in rural districts, similarly there are a great many premature school leavers in the later years in both primary and secondary schools.

Diagram 2-01

1961 CENSUS-POPULATION 4 YEARS AND OVER, WITH OR WITHOUT SCHOOLING, STUDENTS OR NON-STUDENTS BY LEVEL OF EDUCATION ATTAINED, AND FINAL YEAR SUCCESSFULLY COMPLETED

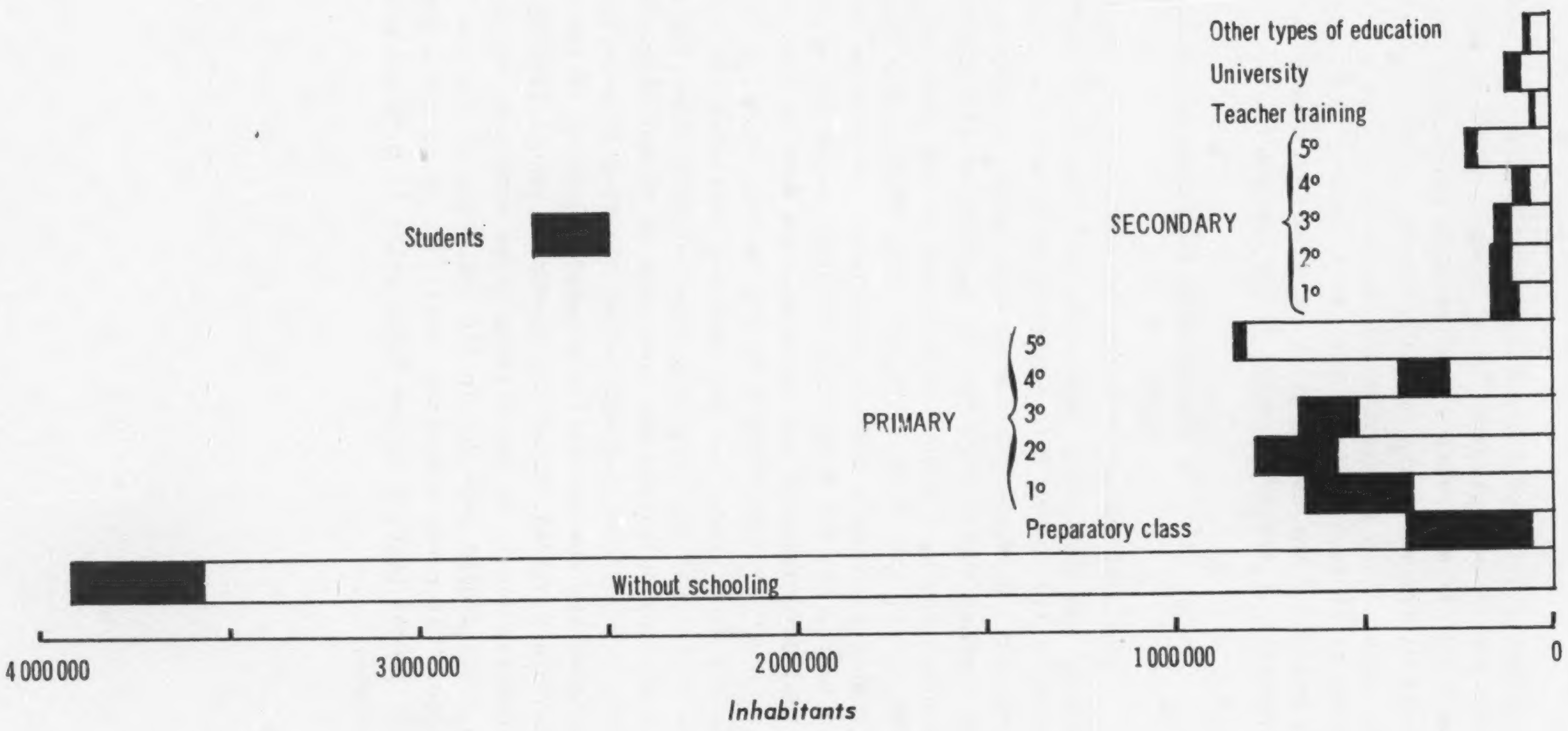


Table 2.01

INDICES OF EDUCATIONAL STANDARD (NUMBER OF SCHOOL YEARS SUCCESSFULLY COMPLETED) IN THE POPULATION AGED FOUR AND OVER, BY SOCIO-ECONOMIC REGIONS(1), ACCORDING TO THE NATIONAL CENSUS OF THE POPULATION IN 1961

SOCIO-ECONOMIC REGIONS	INDICES OF EDUCATIONAL STANDARD (Number of years of schooling)	
	Total population	Population excluding those with no schooling
North	2.2	4.8
North East	2.2	4.2
North Central	1.9	4.0
Lima	4.8	5.9
Central	2.1	4.3
South Central	1.6	4.3
South East	1.3	4.4
South	2.1	4.5

(1) Instituto Nacional de Planificación "Regionalización del Perú", Alternativa 2.

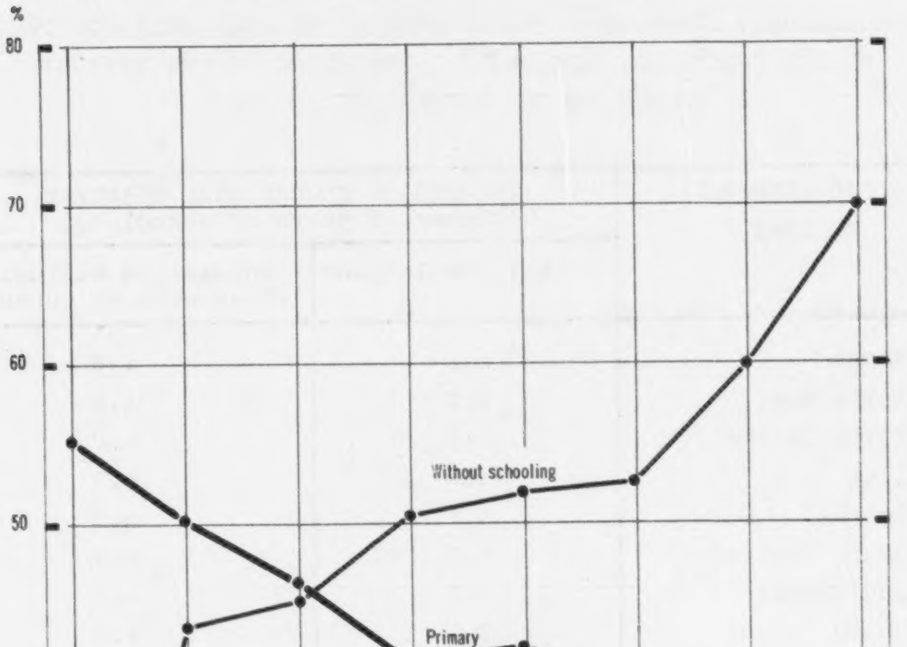
It will be seen from Table 2.01 that regional inequalities of educational standard are very marked for the population as a whole (aged four and over); on the other hand, the disparities are less marked if we consider only the population having attended school; the possibilities of access to education are very unevenly distributed. At one extreme, the urban agglomeration of Lima has the lowest percentage of uneducated inhabitants (18.4 per cent) and the highest average school life (4.8 years); at the other extreme we have the southwest region where 70.3 per cent of the population have never attended school and the average school life is 1.3 years. Diag. 2.02 shows the population structure of the eight socio-economic regions by educational standard.

2.1.1.3. Illiteracy

The rate of literacy is another index of the overall educational standard, for it indicates the proportion of successive generations reaching adulthood without knowing how to read or write,

Diagram 2-02

1961 CENSUS-POPULATION AGED 4 YEARS AND OVER
ACCORDING TO AMOUNT OF EDUCATION RECEIVED AND SOCIO-ECONOMIC REGION



either because they have never attended school or because they did not stay in school long enough to avoid falling back into illiteracy. It also gives some overall indication of the extent to which statutory compulsory school attendance is enforced. According to the 1961 census there were 2,185,646 illiterates in the population aged 15 and over in the country as a whole, which means a total illiteracy rate of 38.9 per cent. The figure for urban areas is 17.7 per cent and that for rural areas 59.5 per cent, or 25.6 per cent for the male population and 51.8 per cent for the female population. Here too we find very great disparities in the educational possibilities available; among the urban male population the rate of illiterates is only 9.31 per cent but at the other extreme, in the female rural population, the figure is 76.4 per cent. These facts are confirmed by analysis of rates of illiteracy by socio-economic regions, according to urban and rural districts and sex. In Diag. 2.03 can be seen boundary values of 2.6 per cent for the male urban population of Lima and 9.3 per cent for the female rural population of the south east region.

The chronological trend can be indirectly traced from studies of the various age groups of the population from 15 and over, by sex and district (cf. Diag. 2.04). To begin with, it will be observed that the possibility of schooling increases with each five-yearly age group; secondly, the rates are markedly lower for rural districts, whereas in urban districts disparities according to sex are lower and tend to diminish with time; a similar trend becomes apparent in rural areas only over the past ten years. However in 1961, 25.2 per cent of young people aged 15 or 16 were illiterates, ranging from a figure of 5.1 per cent for the male urban population to 56 per cent for the female rural population. These illiteracy rates for Peruvian youth of over school-leaving age show that there are endemic causes arising from the shortage of primary schools.

2.1.1.4. The aboriginal languages

According to the national population census of 1961, the mother tongue of 38.1 per cent of the population aged five and over, or 3,139,559 people, was Quechua, Aymara or some other aboriginal language. Nevertheless, as Table 2.02 shows, half this age group speak Spanish, 34.5 per cent even know how to read and write it.

Those whose mother tongue is Quechua constitute the largest group, amounting in 1961 to 32 per cent of the total population aged five and over.

Diagram 2-03

1961 CENSUS-PERCENTAGE OF ILLITERATES AMONG THE POPULATION OF 17 YEARS AND OVER, BY SEX, ZONES AND SOCIO-ECONOMIC REGIONS

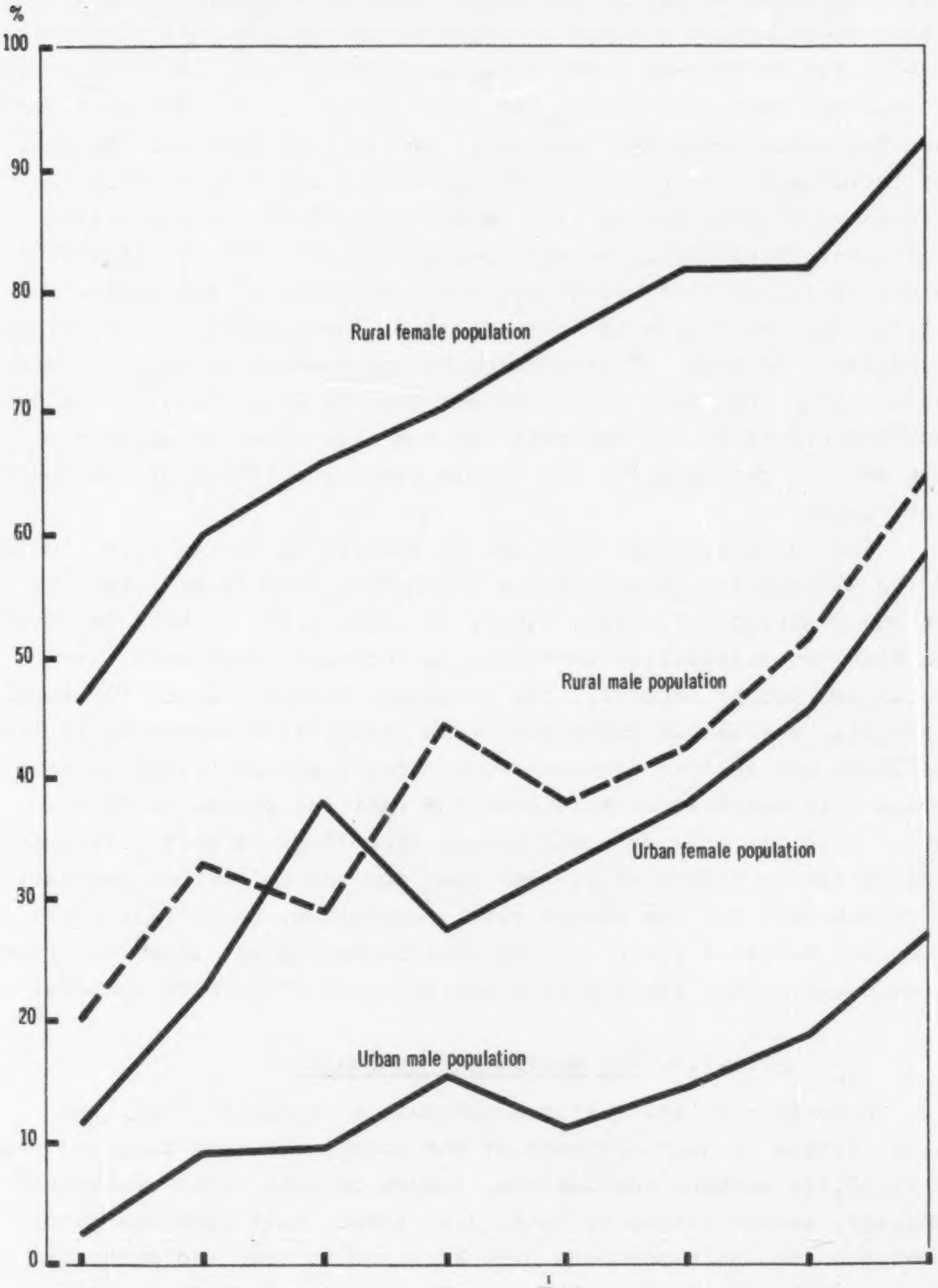


Diagram 2-04

1961 CENSUS-ILLITERACY INDEX BY AGE GROUP, SEX AND ZONE

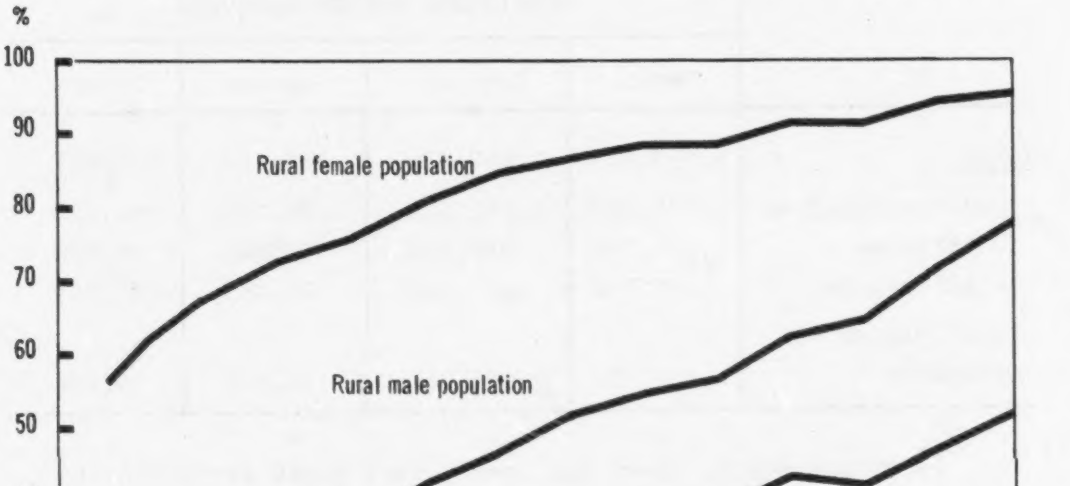


Table 2.02

STANDARDS OF SPANISH SPEAKING AND LITERACY IN THE POPULATION AGED FIVE AND OVER, ACCORDING TO THE 1961 CENSUS, AMONG THOSE WHOSE MOTHER TONGUE IS ONE OF THE ABORIGINAL LANGUAGES

	ABORIGINAL MOTHER LANGUAGE			
	Total	Quechua	Aymara	Others
TOTAL	3,139,659	2,647,674	280,148	211,837
- SPANISH SPEAKING	1,575,657	1,293,322	125,702	156,633
- literate	1,078,015	886,082	99,043	92,890
- illiterate	497,642	407,240	26,659	63,743
- NOT SPANISH SPEAKING	1,564,002	1,354,352	154,446	55,204

In recent years, there has been a very rapid growth in the numbers speaking Spanish in Peru; 80.92 per cent of the population aged five and over now speak Spanish, as compared with only 65 per cent in 1940.

National integration undoubtedly calls for a speeding up of this process but it should be noted that government action is not guided by any clearly defined linguistic policy in respect of the Quechua and Aymara speaking groups; the absence of such a policy is liable to provoke the disappearance of these aboriginal languages, whereas they could be of valuable assistance in certain circumstances, as has already been shown for some community development programmes.

2.1.1.5. General trend in school population

During the past ten years the Peruvian educational system has undergone the most rapid growth in its history. Whereas, in 1955, it had 12,875 different establishments, the figure for 1964 is 18,722 or an overal increase of 45.4 per cent, the percentages for the primary, secondary and higher stages being 41 per cent, 140.6 per cent, 273.3 per cent respectively (Table 2.03 and Diag. 2.05).

In terms of actual numbers, the total enrolment rose from 1,262,765 in 1955 to 2,491,571 in 1964, or an increase of 97.3 per

Diagram 2-05

SCHOOLS AND UNIVERSITIES BY LEVEL AND TYPE OF EDUCATION 1955-1964

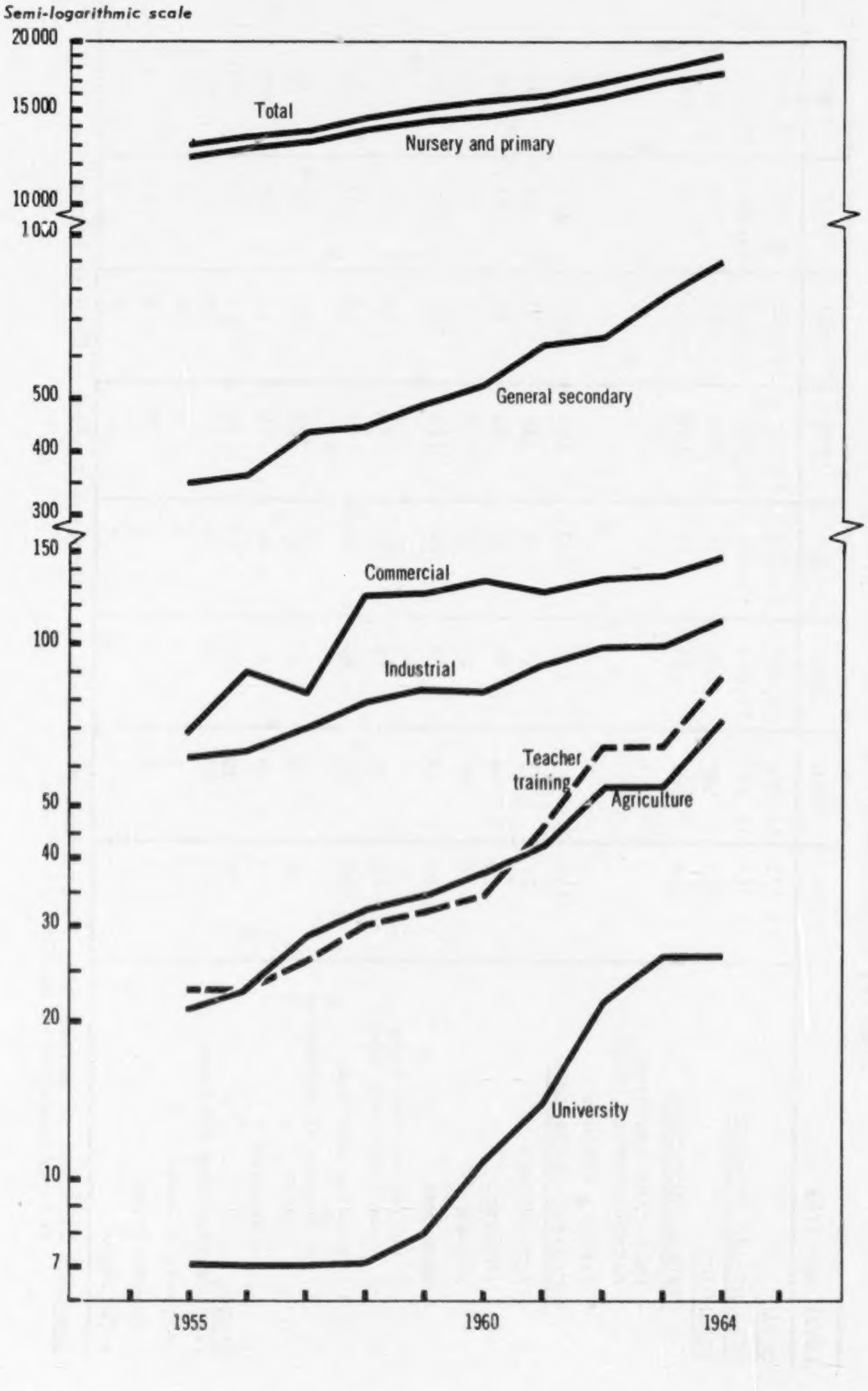


Table 2.03

TEACHING ESTABLISHMENTS ACCORDING TO LEVEL AND TYPE OF EDUCATION, 1955-1964

LEVEL AND TYPE	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
TOTAL	12,875	13,302	13,581	14,335	14,871	15,260	15,796	16,600	17,551	18,722
NURSERY AND PRIMARY	12,345	12,735	12,944	13,624	14,102	14,440	14,860	15,589	16,410	17,407
SECONDARY	500	537	604	674	729	775	877	926	1,050	1,203
GENERAL SECONDARY	348	362	425	441	486	524	619	639	761	876
- Full-time teaching establishments (day)								566	584	779
- Evening schools								73	77	97
TECHNICAL SECONDARY	152	175	179	233	243	251	258	287	289	327
- Agriculture	21	23	28	32	34	37	42	55	55	72
- Industry	62	64	70	79	84	82	91	99	99	111
- Boys	36	38	41	44	48	47	53	57	57	64
- Commerce	69	88	81	122	125	132	125	133	135	144
- Full-time teaching establishments (day)	44	58	52	74	75	76	72	77	81	83
- Evening courses	25	30	29	48	50	56	53	56	54	61
- Principal establis-ments	16	17	15	27	25	29	27	28	27	22
- Annexes	9	13	14	21	25	27	26	28	27	39
HIGHER	30	30	33	37	40	45	59	85	91	112
Teacher-training colleges	23	23	26	30	32	34	45	64	65	86
University level	7	7	7	7	8	11	14	21	26	26
- Universities	7	7	7	7	8	9	11	17	23	24
- Colleges	-	-	-	-	-	2	3	4	3	2

Source : Division de Estadistica Escolar del Ministerio de Educacion Publica y Oficina Nacional Interuniversitaria de Planificacion.

cent, made up of 66.8 per cent in primary schools, 18.5 per cent in secondary schools and 214.2 per cent in higher education. (See Table 2.04 and Diag. 2.06).

In general, for the creation of new teaching establishments, there was no overall programme or individual projects which would have enabled a more efficient use to be made of the human, material, technical and financial resources required for the operation of the system. Most of the new establishments came into being following a single decision taken under conditions that were extremely precarious and therefore very hard to alter.

The growth rate for enrolment in the various levels and branches of education does not correspond to well defined aims. Thus in most branches, the average annual growth rates increased between 1955 and 1960 and between 1960 and 1964, but very unevenly; in primary schools the growth rate rose from 4.8 per cent to 7.2 per cent; in secondary schools from 11.5 per cent to 13.1 per cent; in agricultural colleges from 15.4 per cent to 21 per cent; in primary teacher training colleges from 15.5 per cent to 38 per cent; in secondary teacher training colleges from 11.3 per cent to 37 per cent; and at the universities from 11.3 per cent to 13.2 per cent. In contrast, the growth rate fell from 12 to 9.5 per cent in boys' technical schools, from 21 per cent to 10.3 per cent in girls' technical schools, from 13.2 per cent to 9.8 per cent in commercial departments and from 13.6 per cent to 4.3 per cent in training colleges for physical training instructors. There was even a drop in absolute figures in the numbers of students attending technical colleges. Clearly such uneven rates reflect the absence of any forecast of manpower requirements; for a long time to come, the flow of new graduates will be subject to widely varying trends. Undoubtedly, too, the general trend in the school population has been mainly dominated by the social demand for educational services, usually formulated at local level without any close functional relation to economic and social development, but under the urge of demographic pressure, by imitation - often unwarranted - of existing examples, and by legal provisions such as that for educational services wholly free of charge.

The breakdown of the school population by sex shows that there has been a considerable expansion in Peru of the facilities provided for the female population. In the primary, secondary and higher levels of education, the growth rate for girls over the past ten years or so has been higher than for boys. There has therefore been a rise for

Diagram 2-06

TOTAL SCHOOL POPULATION, BY LEVEL AND TYPE OF EDUCATION 1955-1964

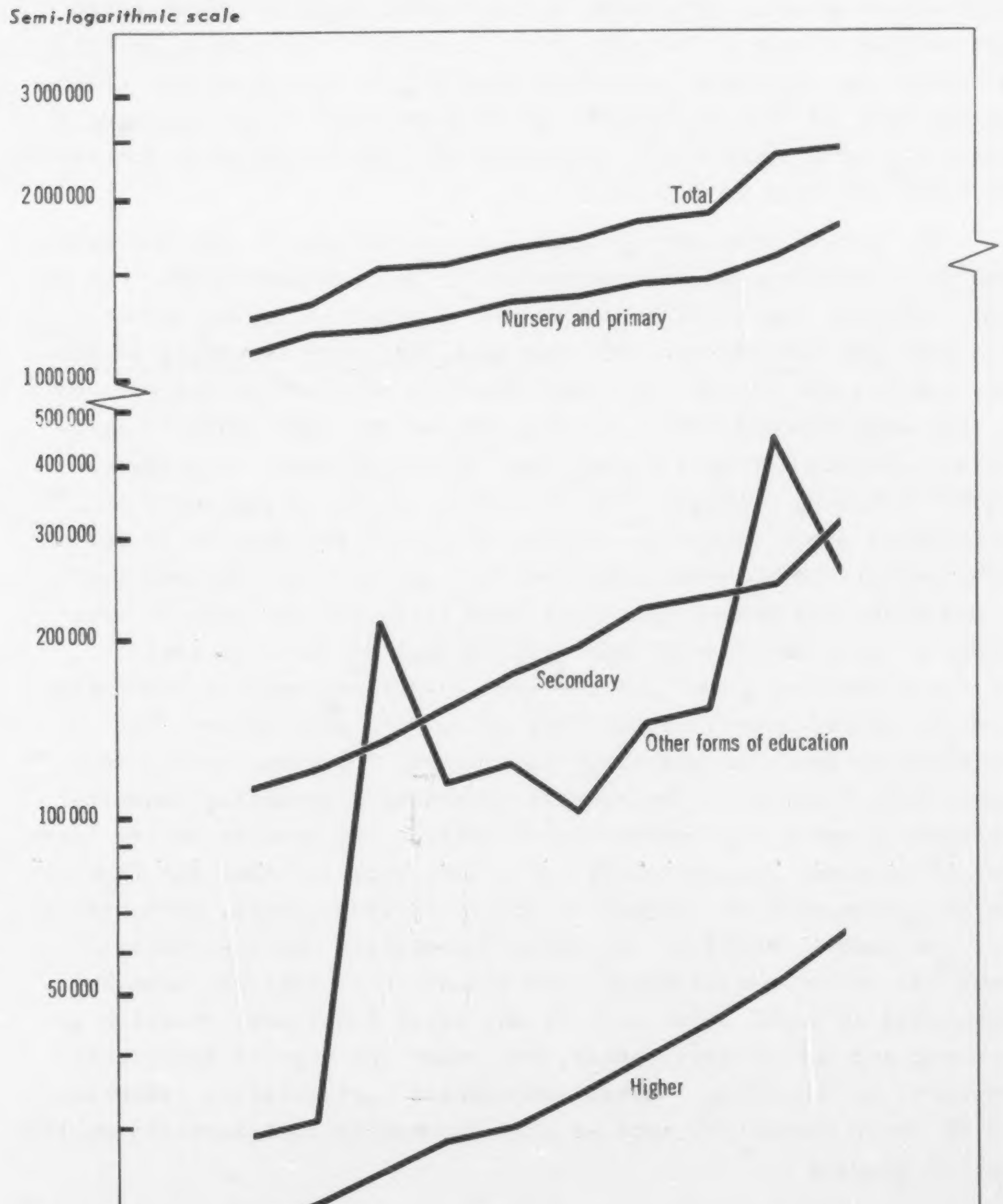


Table 2-04

SCHOOL POPULATION BY LEVEL AND TYPE OF EDUCATION, 1955-1964 (in thousands of students)

LEVEL AND TYPE OF EDUCATION	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
TOTAL	1262.7	1351.5	1575.6	1576.3	1682.0	1728.1	1855.3	1936.0	2370.7	2491.6
NURSERY AND PRIMARY	1100.7	1176.6	1201.9	1273.3	1348.8	1391.8	1441.2	1493.2	1619.3	1836.3
SECONDARY	112.2	121.2	136.3	156.6	178.3	198.3	229.6	239.9	252.9	319.8
- General	92.1	98.0	110.7	122.2	141.1	158.9	184.8	195.2	204.9	260.3
- Technical	20.1	23.2	25.6	34.4	37.2	39.4	44.7	44.7	48.0	59.5
- Agriculture	1.6	1.8	2.1	2.6	3.1	3.3	3.9	4.7	5.1	7.0
- Industry	8.3	9.1	11.0	14.4	16.0	17.0	19.7	18.0	20.2	24.8
- Commerce	10.2	12.3	12.5	17.4	18.1	19.1	21.1	22.0	22.7	27.7
INTERMEDIATE										0.4
HIGHER	20.2	22.7	25.8	29.0	30.3	34.5	39.8	45.9	53.8	63.5
- Teacher training	2.3	2.5	2.6	2.9	3.5	4.0	5.3	7.0	8.3	13.5
- Universities	17.9	20.2	23.2	26.1	26.8	30.5	34.5	38.9	45.4	50.0
OTHER FORMS OF EDUCATION	29.6	31.0	211.6	117.4	124.6	103.5	144.7	157.0	444.7	271.6

Source : División de Estadística Escolar del Ministerio de Educación Pública y Oficina Nacional Interuniversitaria de Planificación.

all levels in the comparative proportion of girls in the various branches of education. The trend was interrupted only in 1964, apparently because of the notable increase in the number of boys in general and technical secondary schools (industrial departments), in teacher training colleges and in university departments of education and science. This comparative increase in the female school population, however, is still not enough to balance enrolment for each sex. The future outlook is more favourable by reason of a considerable increase in general education, the expansion of traditional careers and trades for women and the admission of women to occupational careers hitherto reserved for men.

The Peruvian educational system is very largely run by the State. In 1966, State schools accomodated 85.9 per cent of the total school population at nursery and primary levels, 74.2 per cent at general secondary level, 90.2 per cent at technical secondary level, 100 per cent at the so-called "intermediate" stage, 65.4 per cent in the training colleges and 95.7 per cent in the universities. During the past five years, the preponderance of the State system at primary, secondary and intermediate levels has increased, but for some time past the number of universities and colleges providing higher education has tended to increase in the private sector.

Enrolment trends in private schools bear witness to the absence of any clearly defined policy as to the State's responsibility for the various branches of the education system. At primary level, business undertakings are statutorily obliged to contribute to the financing of approved schools for the education of their employees' children. Actually, this obligation is only to a very limited extent complied with, owing to gaps in the legislation and the shortcomings of government departments; during the past ten years the corresponding school population accounted for under 5 per cent of the total numbers obtaining school leaving certificates. At secondary level the statutory provision for free education has accentuated the demand for admission to technical secondary schools, where costs are highest. In higher education, the private teacher training colleges, banned since 1941 by the Education Act, have had to be reinstalled. These schools have proliferated precisely in the capital, where the labour market is tightest; the process is paralleled by the mushrooming of small private universities.

In general secondary schools, the State's responsibilities have expanded; the annual growth rates for school population between 1955 and 1960 and between 1960 and 1964 rose from 4.5 per cent to

7.6 per cent at primary level and from 14.2 per cent to 16.6 per cent in general secondary schools. In private schools, in contrast, the growth rate fell respectively from 6.4 per cent to 5.8 per cent and from 7.3 per cent to 5.4 per cent.

In the rural areas, the only sizeable school population is at the primary level, at the others it varies from 7.2 per cent to 5.3 per cent of the total number of pupils. At nursery level, 91.1 per cent of the pupils come from urban areas; at primary level the percentage in urban areas was 51.3 per cent in the first year, gradually rising to 79.5 per cent in the last year. These figures show that the access of the rural population to education is still limited. The structure of the school population analysed year by year represents a very steep pyramid, as can be seen from Diag. 2.07 referring to 1964. This is a feature common to all unproductive and highly selective educational systems.

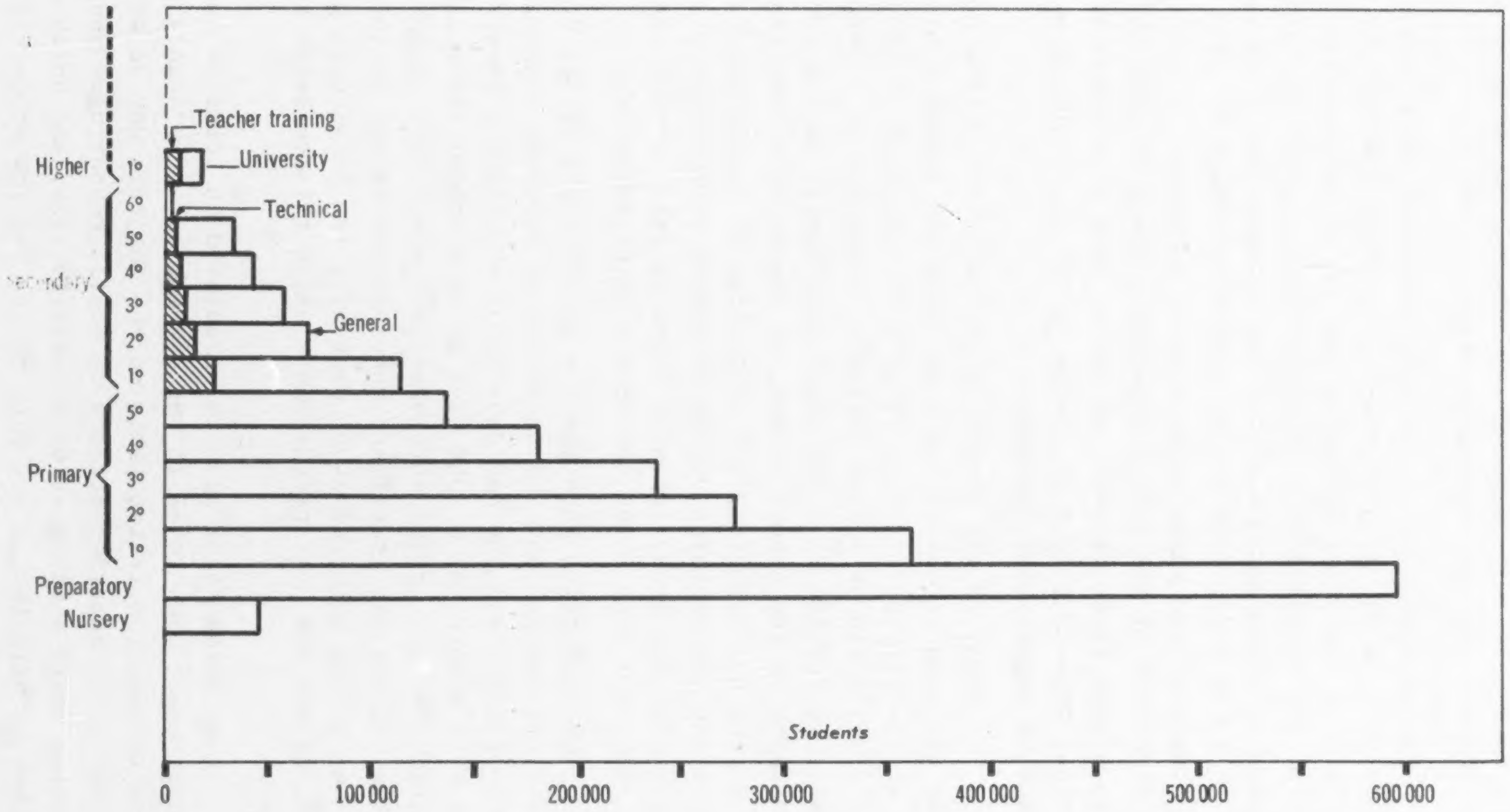
The study of the annual structure of the school population - to be analysed in detail later by level and branch - also shows the worthwhileness of "pass rates". If enrolment in the last year of a study cycle or school career is expressed as a percentage of first year enrolments a few years previously, having due regard to the length of the school course, we arrive at a "net pass rate" indicating approximately the proportion of pupils successfully completing the training course or school curriculum. Diag. 2.08 illustrates the trend for such rates in Peru between the years 1960 and 1964, for each level and each type of education.

The pass rates show the low productivity of the country's educational system and the tardiness of reforms. Although first year enrolment and the net pass rates are vitally important, since they will govern for a long time to come school flows, the training of graduates and school enrolment as a whole, the educational system has not set itself any very precise target in this respect and has hardly bothered about drop-out, the total cost of the services and the cost per graduate which this omission is liable to cause.

Pass rates might also be calculated in terms of numbers graduating at each level in the system, but very scanty and incomplete information is available on the subject. Nor do we have any statistics or specific studies on pupils repeating a year, or those resuming their studies after an interruption, and which would be factors in calculating net pass rates. The low productivity of the

Diagram 2-07

EDUCATIONAL STRUCTURE FOR SCHOOL YEAR 1964



educational system is one of the most important problems for Peru but there are hardly any serious studies of its causes. For instance, it is known that 6.5 per cent of primary school pupils left prematurely in 1963, consisting of 5.4 per cent in urban districts and as much as 8.2 per cent in country districts; the studies conducted into the causes of this phenomenon, however, attribute it mainly to the "statutory school-leaving age"; this extremely general cause is supposed to account for 44.9 per cent of the early school-leavers, but the educational authorities are unable to carry out any deeper analysis because there is no system of permanent registration whereby application of the law might be checked. To this should be added 12.3 per cent of wastage due to "change of address", but it is not known whether these did in fact stop attending a school, and 9.1 per cent for "changes of registration" which do not constitute net losses for the country as a whole but concerning which no adequate particulars are available. On the other hand, 15.6 per cent of the early leavers are attributed to "illness" and 11.7 per cent to the "need to start work", and these percentages throw some dim light on one or two fundamental causes of this problem(1).

Another factor to be considered is that of the failure rate at the end of a cycle of studies. In the five departments of official technical secondary education in 1964, failure rates were recorded of between 42 per cent and 33.6 per cent for the first year and 15.7 per cent to 4.1 per cent in terminal classes. The heavy percentages of failures, especially in the first year, are a highly significant feature confirming the selectivity of the Peruvian educational system. This anomaly warrants a serious enquiry into the link-up between the various levels of education, for the first-year failures observed in the different cycles are mainly due to the inadequacy of previous training.

Apart from the fact that the age of the pupils does not correspond to the normal for their class, and to which we shall refer later, allowance must also be made for family conditions preventing regular school attendance, inequality in the distribution of the resources necessary for education, the precarious situation of the schools from the point of view of teaching staff, audio-visual aids and practical teaching methods; the short timetables,

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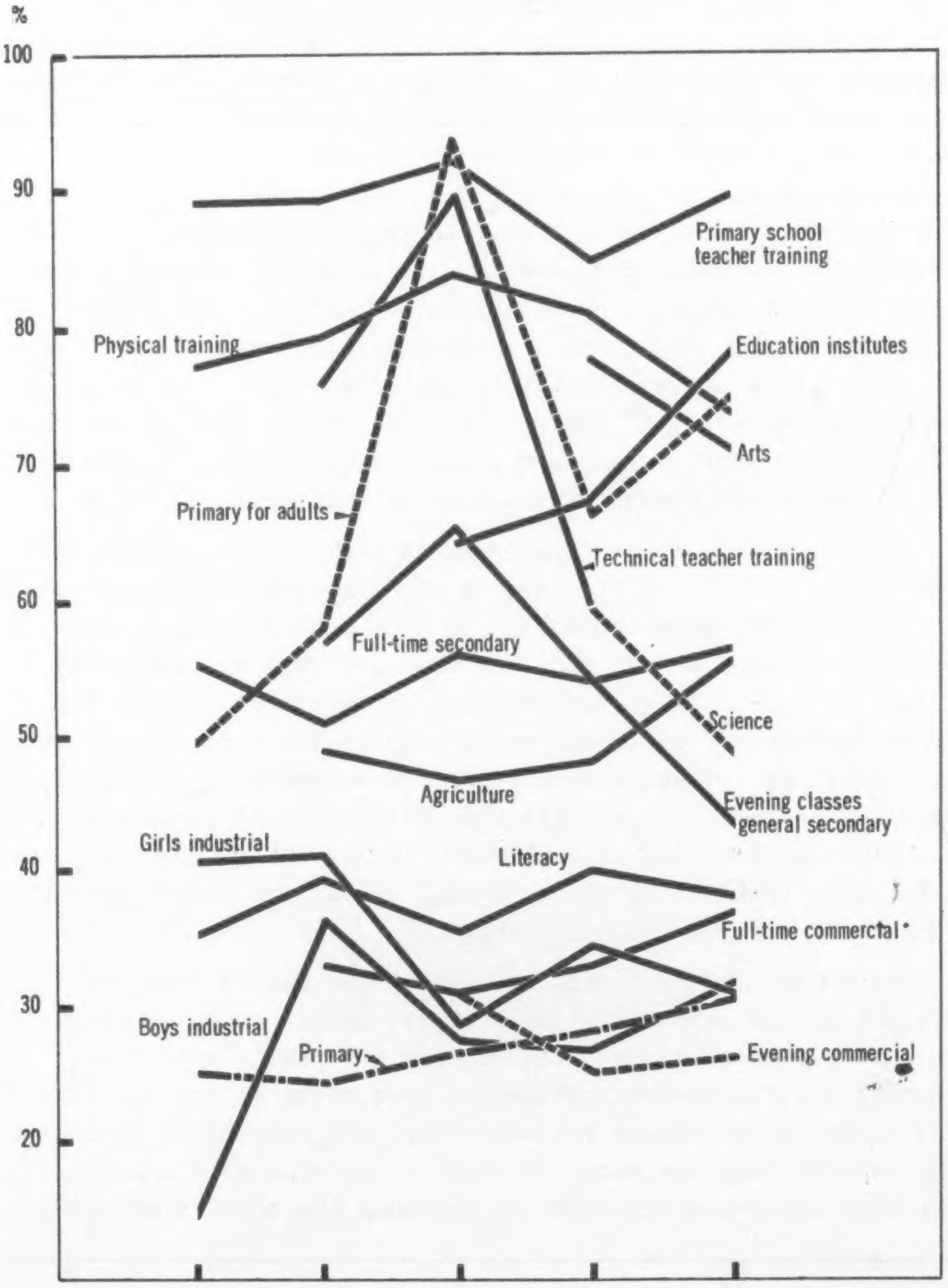
(1) Ministerio de Educación Pública, División de Estadística Educativa. "Estadistica Educativa 1962-1963".

Diagram 2-08

TREND OF GROSS PASS RATES, BY LEVEL AND TYPE OF EDUCATION 1960-1964



the continuing fall in quality standards, and possibly also the inefficient marking systems used in the schools are also relevant factors. Hence the remarkable growth in numbers of the Peruvian educational system has not been accompanied by a comparable effort at qualitative improvement and higher productivity. This means a consequent limitation of the possible contribution of education to national growth despite the substantial financial outlay. If this state of affairs continues, it will be impossible adequately to channel the social demand for educational services and there will be an ever-growing proportion of students whose educational aspirations are frustrated.

There are also other problems: students who fail to complete their courses; career and specialisation changes; students who register for several courses or occupations, and the movement of students and graduates. All these are very important for the deciding of co-ordinated policies for educational development, but none of them so far has been properly studied.

The correlation of age to educational standard is far from satisfactory (cf. Diag. 2.09) as a result of belated entry into primary school and the failure to make regular progress through school. Although in recent years increased enrolment has helped slightly to reduce this lack of correlation(1), the rate of improvement is still very slow. In a general way, the correlation of age and standard is more satisfactory and is improving more rapidly among girls in urban districts.

If the normal age range is considered to be: from six to eleven in primary schools; 12 to 16 in general secondary schools; 14 to 18 in technical secondary schools, and 17 to 21 in teacher training colleges and in universities, the percentage whose age corresponded to the class in 1964 was 68, 64.2, 66.7, 75 and 40 per cent respectively for the different levels. An analysis of average ages and age spread for the pupils in each class in primary and secondary schools shows children to be late in starting primary school, with repercussions at secondary level. Furthermore, for any particular level the

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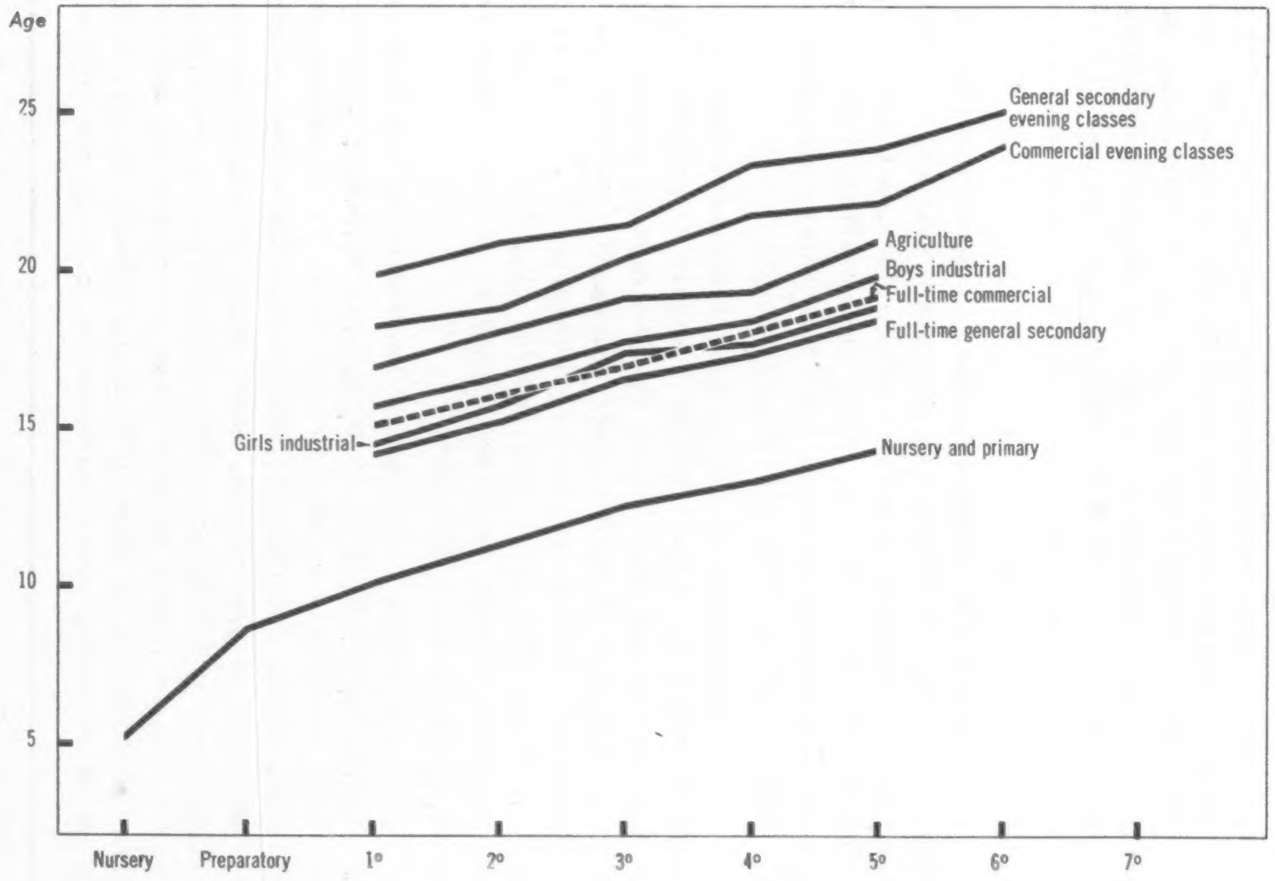
(1) Shown by a comparison of the results of the 1961 Population Census with sample surveys in educational establishments in 1964.

Diagram 2-09

AVERAGE AGE OF SCHOOL POPULATION BY CLASS, LEVEL AND TYPE OF EDUCATION, 1964



age spread diminishes as the years go by, which apparently indicates that the educational system rejects those pupils whose age is farthest from normal.

If the number enrolled of those of school age is compared with the total population of corresponding age it is possible to estimate the growth in enrolment rates for each age (see Diag. 2.10 for 1964).

Generally speaking, the general enrolment indices are higher for males than females. In addition the numerical expansion recorded over the past four years has become more marked, the maximum enrolment rate being 65.4 per cent for children aged twelve years in 1961, and 74.3 per cent for children aged nine years in 1964.

At primary level enrolment for the age group five to nine rose from 38.7 per cent in 1961 to 52.7 per cent in 1964. At secondary level enrolment is highest for those aged 16, the reason for this backwardness being due to the late start at primary level; there is no great difference in age structure between the general and technical sides, although for the latter the statutory minimum admission age is 14. The strategic importance of a better concordance between age and class level is shown by the fact that, in 1964, the population between the age of six and eleven (1,890,000 inhabitants) corresponded almost exactly to the number of places available in primary schools throughout the country (1,836,286).

Another factor to be taken into account is the estimate of "gross transfer coefficients" between two successive levels of education, i.e. the proportion of pupils attending the terminal classes in a given cycle and passing into the first year of the next cycle at the end of the school year. Diag. 2.11 shows the trend in these coefficients in secondary, intermediate and higher education in 1960 and 1964.

In 1964, the first year enrolment in general secondary education was equal to 72.4 per cent of fifth year enrolment in primary schools in 1963; part of the remainder, that is 19.5 per cent, represents first year admissions to technical secondary schools. The transfer rate from primary to secondary level is therefore very high, reaching 91.9 per cent. This is due to the considerable increase in first year enrolment following the coming into force of the Act providing for free education. Presumably, in net figures, the coefficients should be lower, in view of the number of those kept back for an extra year and of those resuming their studies after an

Diagram 2-10

ENROLMENT OF SCHOOL-AGE POPULATION, BY LEVEL, TYPE OF EDUCATION AND SEX, 1964

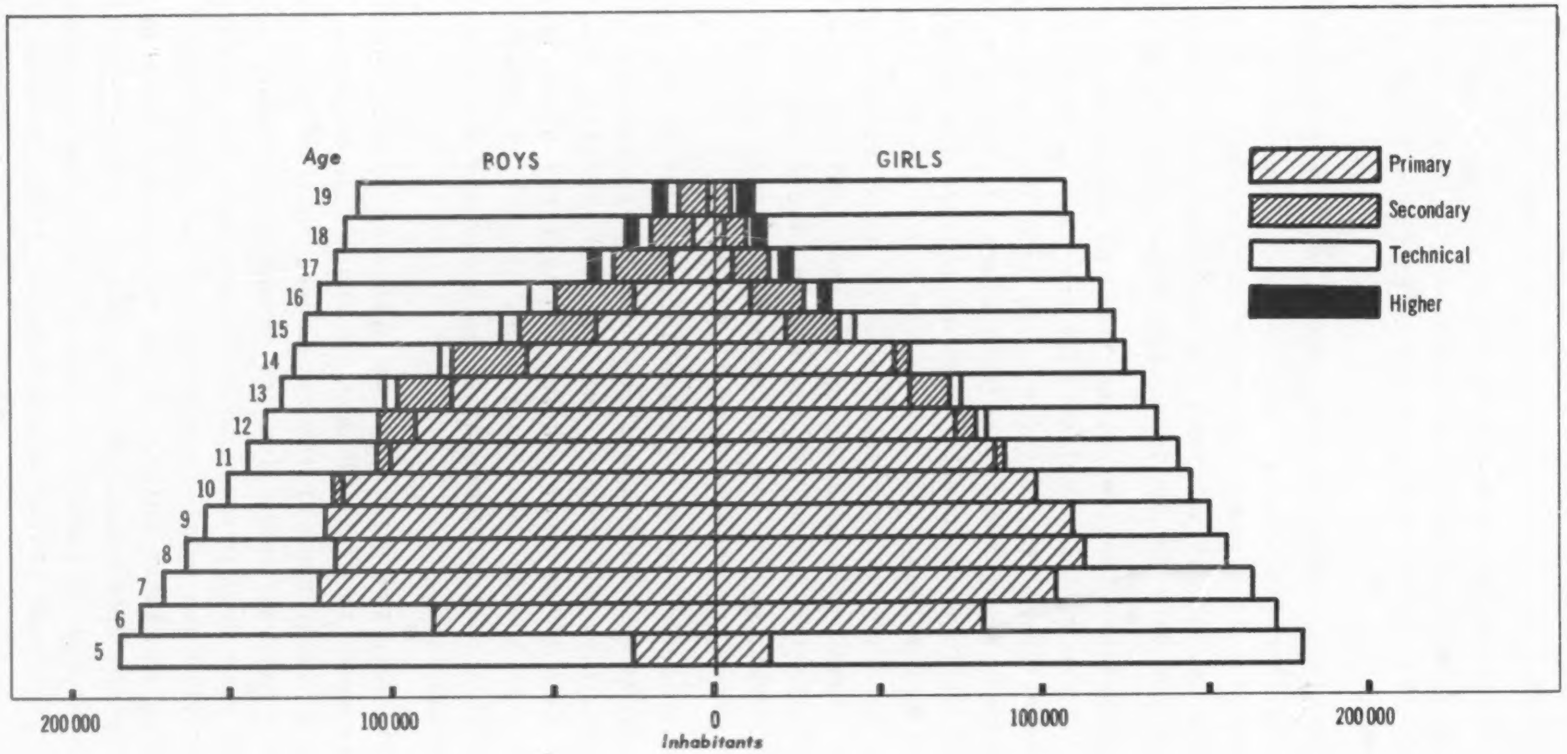
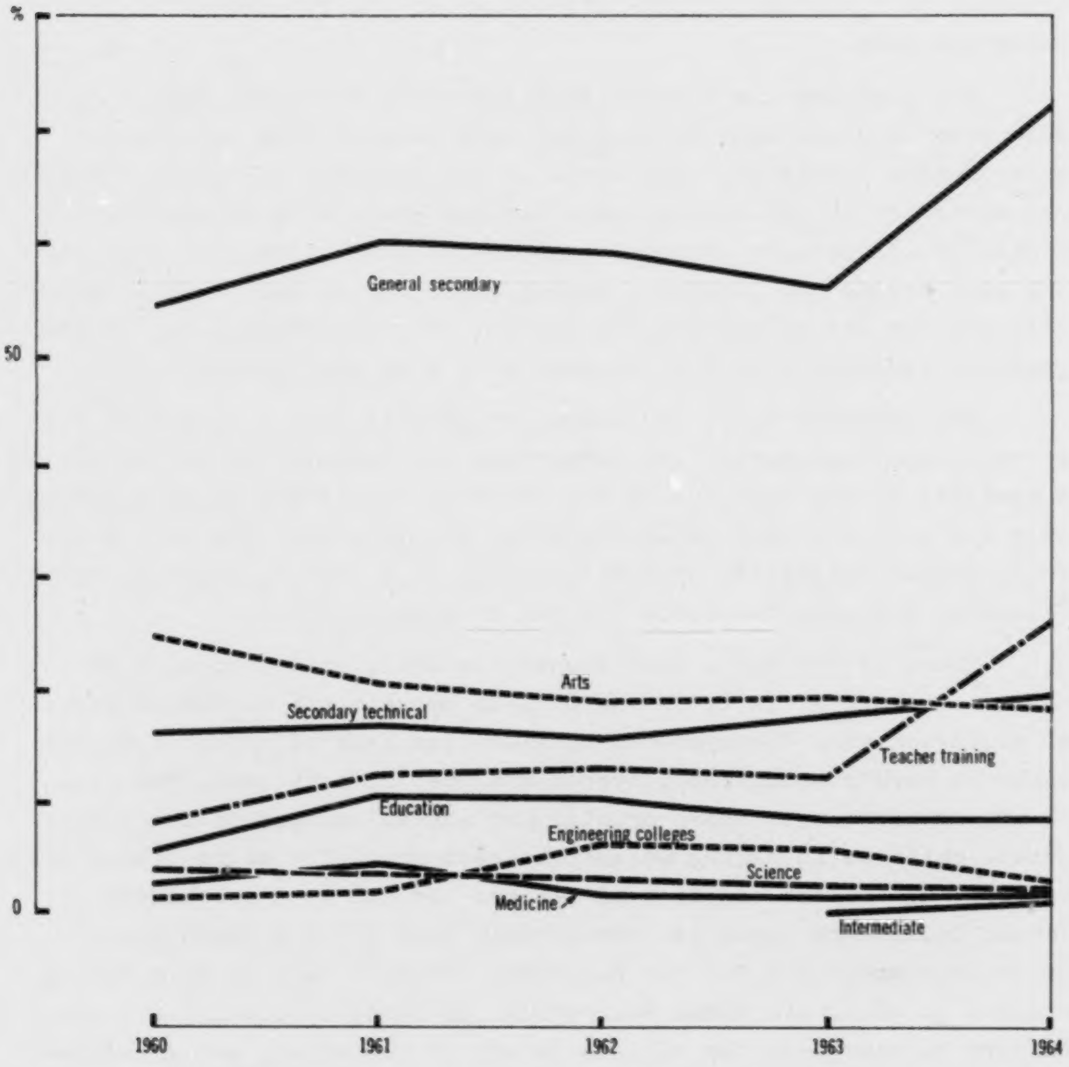


Diagram 2-11

GROSS COEFFICIENTS OF CONTINUATION TO NEXT LEVEL,
BY LEVEL AND TYPE OF EDUCATION, 1960-1964



interruption. Furthermore, the value of these coefficients is relative only, in that the pass rate at primary level was very low, with only 28.3 per cent in 1963; thus it is to be assumed that the expansion and improvement of primary schools, in spite of everything, would tend to reduce these transfer coefficients which are at present influenced by an exceptional situation in which parents endeavour to obtain secondary schooling for their children and consider conditions abnormal or capacity inadequate because all the "overflow" is not being absorbed.

The transfer coefficient from secondary to higher education rose from 44.3 per cent to 61.2 per cent between 1960 and 1964, with similar trends to those noted in the previous paragraph, secondary education being regarded as a natural prelude to university admission. University entrance examination statistics show that for the past decade the pass rate stayed at around 40 per cent, although this was due not so much to the ability of the candidates as to the physical incapacity of the university to take more students.

The transfer rates by branch and specialisation also show to which occupations pupils are attracted. For example, it is rather surprising to see that out of 100 children completing primary school only 2.3 per cent took up agricultural studies, and that out of 100 young people completing secondary school 29.2 per cent went in for teaching, but only two opted for the sciences.

There is one basic fact however to which attention must be drawn, namely that it is in the link-up between the different levels of education that the symptoms of a serious lack of integration and unity in Peru's educational system are most clearly seen. The lack of any research into these crucial and abrupt changes in the life of school children is having weighty consequences. The difficulties are entirely due to the adoption of reforms limited to a particular level, thus, each level can comfortably hold the one immediately below it responsible for the failures, but will have to make costly efforts to eliminate these weaknesses. In these circumstances, the failure to integrate the various levels of education, and an educational system whose structure has little in common with the requirements of the economy, compel students to face, without adequate guidance in a period of rapid educational expansion, a great many options throughout their school lives, and constantly to adapt themselves to changes in the nature and structure of the syllabuses.

2.1.1.6. Compulsory schooling and the development of primary education

The 1961 Population Census showed there to be 533,729 youths between the ages of seven and 15 who were illiterate and not attending school. To estimate the extent to which the compulsory schooling act is applied, the number of youths between the ages of seven and 16 included among the 1,699,026 inhabitants and who, according to the Census, had prematurely left primary school should also be included, but this is not known. Considered as a percentage of the total population between the ages of seven and 16, those not attending school therefore corresponded to 19 per cent of illiterates, plus an unknown percentage of early leavers from primary school.

Whereas in the past, 100 per cent school enrolment appeared practically unrealisable, this is no longer impossible, especially if a substantial rise in the productivity of primary education can be reckoned on, if appropriate administrative machinery is installed to supervise compulsory schooling (e.g. a system of continuous registration, by district), and if, in rural areas, heads of firms are forced to meet the obligations laid upon them by the Constitution to supplement the educational efforts of the State. Primary school enrolment is summarised in Table 2.05 for the period 1955-1964.

The expansion of primary education has speeded up over the past five years, particularly as a result of the State's drive to eliminate inequalities of access to education between boys and girls and between urban and rural areas. Even so, the Government's reaction to the growing social demand has been mainly to create teaching posts, wherever annual budgets allowed, without any prior planning of distribution or consideration of the pupil-teacher ratio. The decisive factor in the towns appears to have been demographic pressure, and in the rural areas collective action in the form of contributions of land, equipment and premises, and a school building campaign. The development of primary education has largely contributed towards linguistic integration (85 per cent of the population now speak Spanish), a drastic reduction in illiteracy (less than 15 per cent of the young people under 15 are now illiterate), a better response to compulsory schooling (the net deficit of school places has been reduced from over 950,000 to under 300,000 during the past five years) and the general improvement in the education of the population at large (amounting at present to something in the order of 0.3 of a class per year).

Table 2-05

TREND IN SCHOOL POPULATION IN FULL-TIME PRIMARY EDUCATION, 1955-1964

Year	Pupils (in millions)	% Boys	% in state schools	Average rate of annual increase (%)				
				Total	By sex		By sector	
					Boys	Girls	Public	Private
TOTAL								
1955	1,100.7	59.3	86.2					
1960	1,391.8	57.2	85.2	4.8	4.0	5.9	4.5	6.4
1964	1,836.3	55.3	85.9	7.2	6.3	8.3	7.4	5.8
URBAN AREAS								
1961	861.2	53.2		7.3	9.4	4.9		
1964	1,064.7	56.3						
RURAL AREAS								
1961	580.0	62.1		10.0	5.0	17.3		
1964	771.6	54.0						

Diag. 2.12 shows the trend between 1955 and 1964 for full-time primary school enrolment by class, pass rate and sex. Diag. 2.13 shows the average age of pupils, by class, sex and rural or urban area in 1964, and enrolment rates for the population of school age, by sex, for 1961 and 1964. The unfavourable repercussions throughout the whole educational system of the low productivity and the wide age spread of pupils in primary schools have already been referred to.

The results achieved by the Ministry of Education in the campaign against illiteracy and the adult education programme, which deserve a special analysis (see Table 2.06), should also be mentioned.

The only real progress made during the past ten years in the fight against illiteracy was in 1957 and 1963, the years when a full-scale Government drive took place. Despite the magnitude of these efforts, the campaign against illiteracy is still a matter of widely dispersed effort with sporadic bursts of activity and no real overall strategy, and with the somewhat meagre return of under 40 per cent success. The rapid growth of primary education (full-time schooling and evening classes) is mainly in the big urban centres which absorb heavy migratory flows from country districts; in spite of the measures for combatting illiteracy and providing elementary education for the population over school-leaving age, the trend in annual enrolment seems to show that a sizeable proportion of children and young people find themselves compelled to give up full-time schooling.

So far as handicraft and elementary technical training are concerned during the past three years the Government has been increasing its effort to develop handicrafts and to raise the standard of unskilled juvenile manual and clerical workers; this action has partly eliminated the risk of unemployment and under-employment.

2.1.1.7. Trend in secondary education

As can be seen from Table 2.07 the expansion of secondary education has been spectacular. Enrolment for this level (which has a general and a technical side) rose at an annual rate of 12 per cent from 1950 to 1964. The same general trends, but a little stronger, are noted as for full-time primary schooling. To begin with, the rise in total numbers has been much faster; more and more girls are being admitted to the secondary schools; most of the establishments are provided by the State and growth is much faster than in the private sector, which lags behind the general growth rate.

Diagram 2-12

TRENDS FOR SCHOOL POPULATION IN PRIMARY SCHOOL, BY YEAR AND PASS RATE, AND BY SEX, 1955-1964

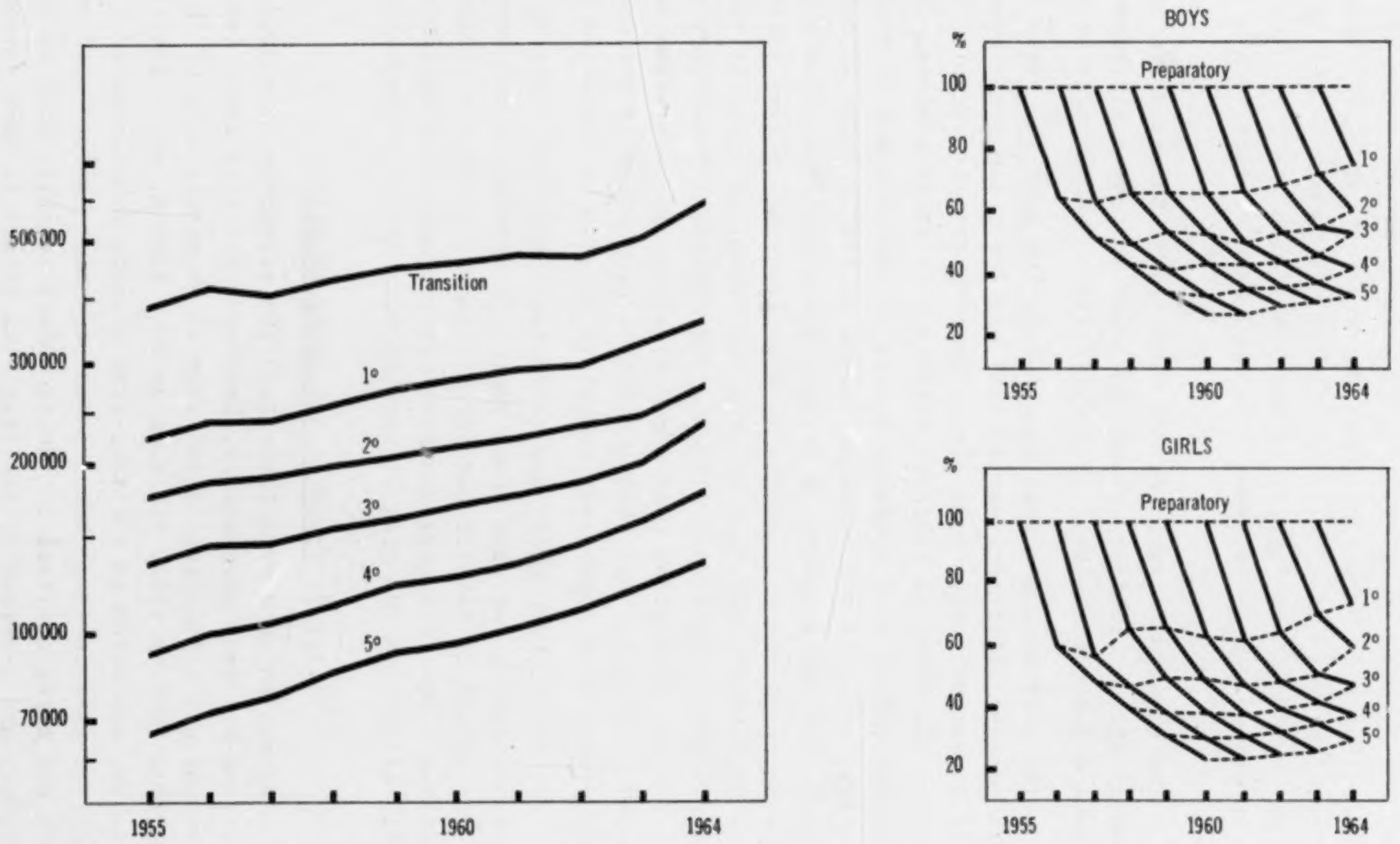


Diagram 2-13

AVERAGE AGE OF CHILDREN IN NURSERY AND PRIMARY SCHOOLS, BY SEX AND AREA, IN 1964 AND ENROLMENT RATE CORRESPONDING TO NURSERY AND PRIMARY SCHOOLS BETWEEN 5 AND 16 YEARS OF AGE, BY SEX, IN 1961 AND 1964

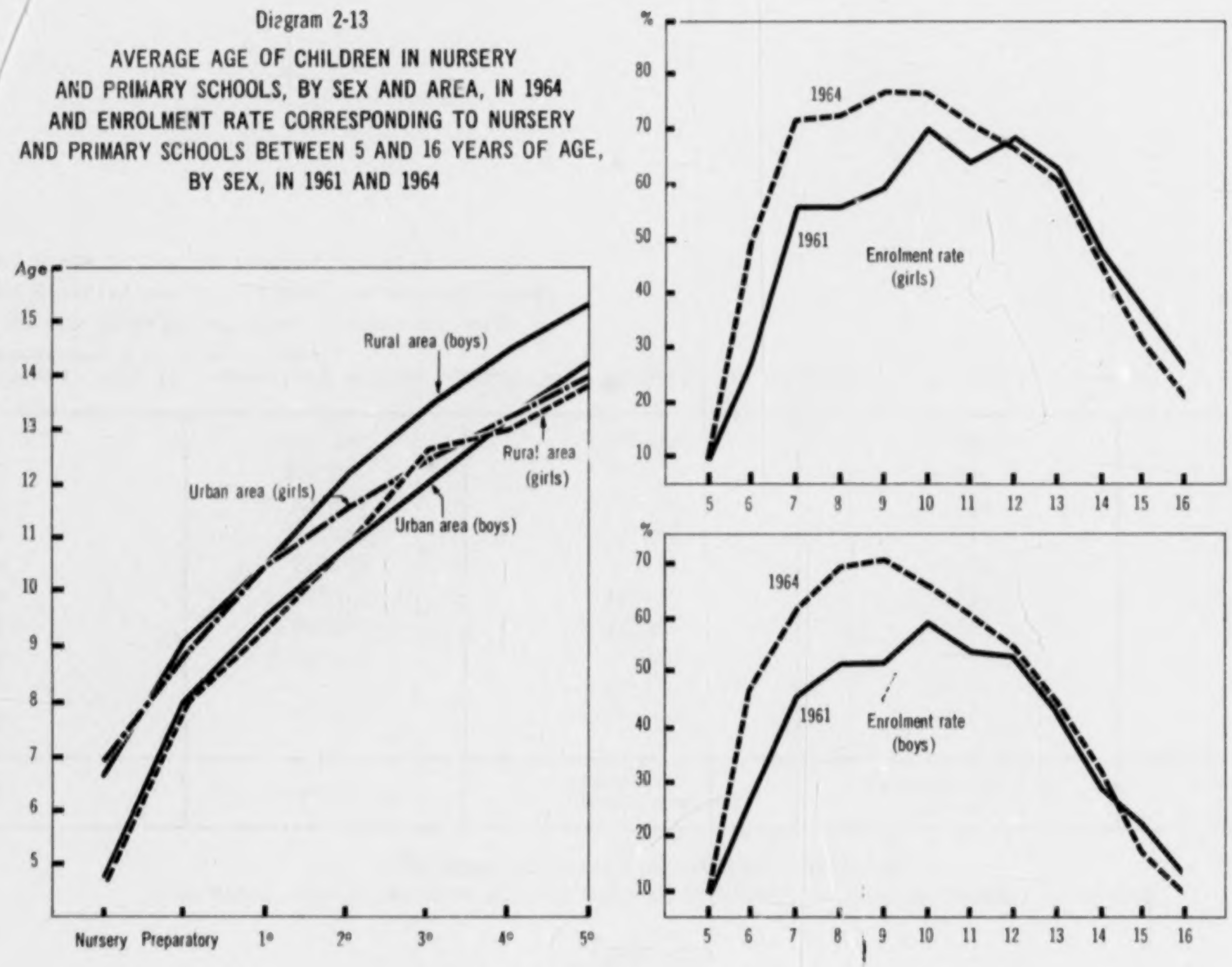


Table 2-06

POPULATION BENEFITING FROM THE MINISTRY OF EDUCATION'S CAMPAIGN AGAINST ILLITERACY AND ADULT EDUCATION PROGRAMMES, 1955-1964

Year	Literacy (1)	Primary evening classes (2)	Craft instruction (3)	Refresher courses (4)
1955	....	26,860	.....	2,732
1956	....	28,177	.....	2,801
1957	177,059	31,988	.....	2,504
1958	80,184	35,001	.....	2,207
1959	78,011	43,199	576	2,860
1960	51,248	48,218	657	3,375
1961	87,278	53,862	772	2,802
1962	93,273	60,555	988	2,230
1963	377,621	63,077	1,076	2,923
1964	167,856	96,328	3,393	3,974

(1) The National Plan for combatting illiteracy and for adolescent and adult education was launched in 1957. 1963 was proclaimed a "literacy year".

(2) Given on the premises of urban primary schools.

(3) Classes given by handicraft centres and workshops.

(4) Classes given by junior technical colleges.

During the past five years an average of 100 new secondary schools have been built each year, throughout all the main urban centres of the country. The decisive factor here has been the pressure brought to bear by the parents to ensure that their children go beyond the primary stage. These increasingly widespread social aspirations have made public opinion sensitive to the problem of the unsatisfied demand for schooling, and this has induced both government and parliament to envisage the large-scale building of new schools. This has been done by means of isolated action, with no overall appraisal of requirements or resources, and has often resulted in the building of new secondary schools in sparsely populated centres.

Table 2.07

TREND FOR SECONDARY SCHOOL POPULATION (GENERAL AND TECHNICAL BRANCHES) FROM 1955 TO 1964

Year	Number of pupils (thousands)	% of boys	% in state schools	Average annual increment				
				Total	By sex		By sector	
					Boys	Girls	Public	Private
1955	112.2	72.4	63.5					
				12.0	11.7	12.7	14.2	7.9
1960	198.3	62.1	69.8					
				12.7	12.1	12.6	15.6	5.1
1964	319.9	60.8	77.2					

There is still some prejudice against technical education, as there was at the time when the more backward pupils had to pass "maturity" or "selection" tests, which frequently resulted in their transfer from the general to the technical stream, owing to the shortage of school places. These pupils naturally then tried to get back into the general stream to ensure that equivalence was maintained between the two streams. The situation was aggravated by other factors: first, the reserved attitude of technical teachers who looked on any attempt at a closer integration of the general and technical streams by the introduction of a common secondary cycle as a threat to the labour market; secondly, the application of the Free Education Act accentuated the dominant tendencies without correcting the negative factors mentioned earlier.

Diag. 2.14 shows the trends for the various secondary streams between 1955 and 1964. For the reasons noted previously, even in 1964 the general stream still had 81.4 per cent of the total number of pupils, leaving only 18.8 per cent for the technical branch. The breakdown for the latter in that year was as follows: commercial departments 46.6 per cent, industrial departments for boys 23 per cent, for girls 18.6 per cent and agricultural departments 11.8 per cent. This breakdown has obviously not followed a planned programme.

In the general stream, the increasing popularity of evening courses has been remarkable; these have been attended by large numbers of workers wishing to improve their employment possibilities, and by young men compelled for various reasons to abandon full-time study.

In the technical stream the increase in enrolment has been irregular; it is steeper in the industrial departments for girls and in the agricultural and commercial departments, especially evening classes, and the total enrolment has thus been considerably increased.

Diag. 2.15 shows the trend for first year enrolment and Diag. 2.16 for certificated students in the various streams of secondary education. The former indicates growth trends for the different streams which, on the basis of the pass-rate mentioned above, will in the medium term supply the certificated students shown in the latter.

Diag. 2.17 shows, for the population between the ages of 10 and 24, the enrolment rate for secondary education, by sex, for the years 1961 and 1964. As will be seen, the rates have risen very sharply, especially for girls.

2.1.1.8. Trend for higher education

For the purpose of this survey, higher education refers solely to teacher training colleges and universities. In Peru, since 1953, teacher training has been a form of post-secondary education for all branches, conferring the requisite diplomas for teaching in primary and secondary schools.

The growth of higher education is summarised in Table 2.08 and in Diags 2.18 and 2.19, over the past ten years.

Between 1960 an 1964, enrolment in higher education rose 16.5 per cent per annum, which is an even higher rate than that for

Diagram 2-14

TREND OF SCHOOL POPULATION IN SECONDARY SCHOOLS, BY TYPE OF EDUCATION, 1955 TO 1964

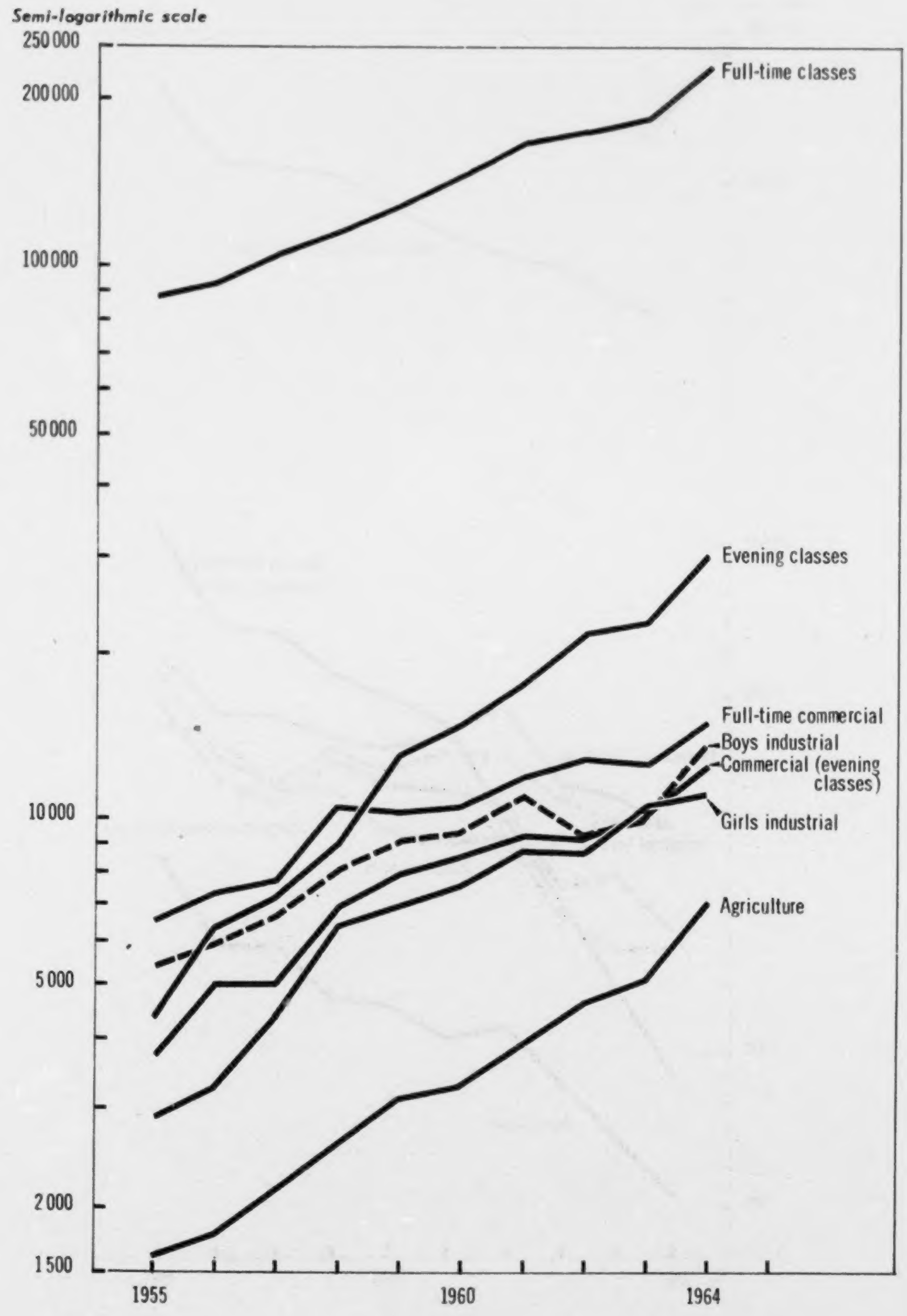


Diagram 2-15

TRENDS OF SCHOOL POPULATION IN FIRST YEAR OF SECONDARY SCHOOL, BY TYPE OF EDUCATION, 1955 TO 1964

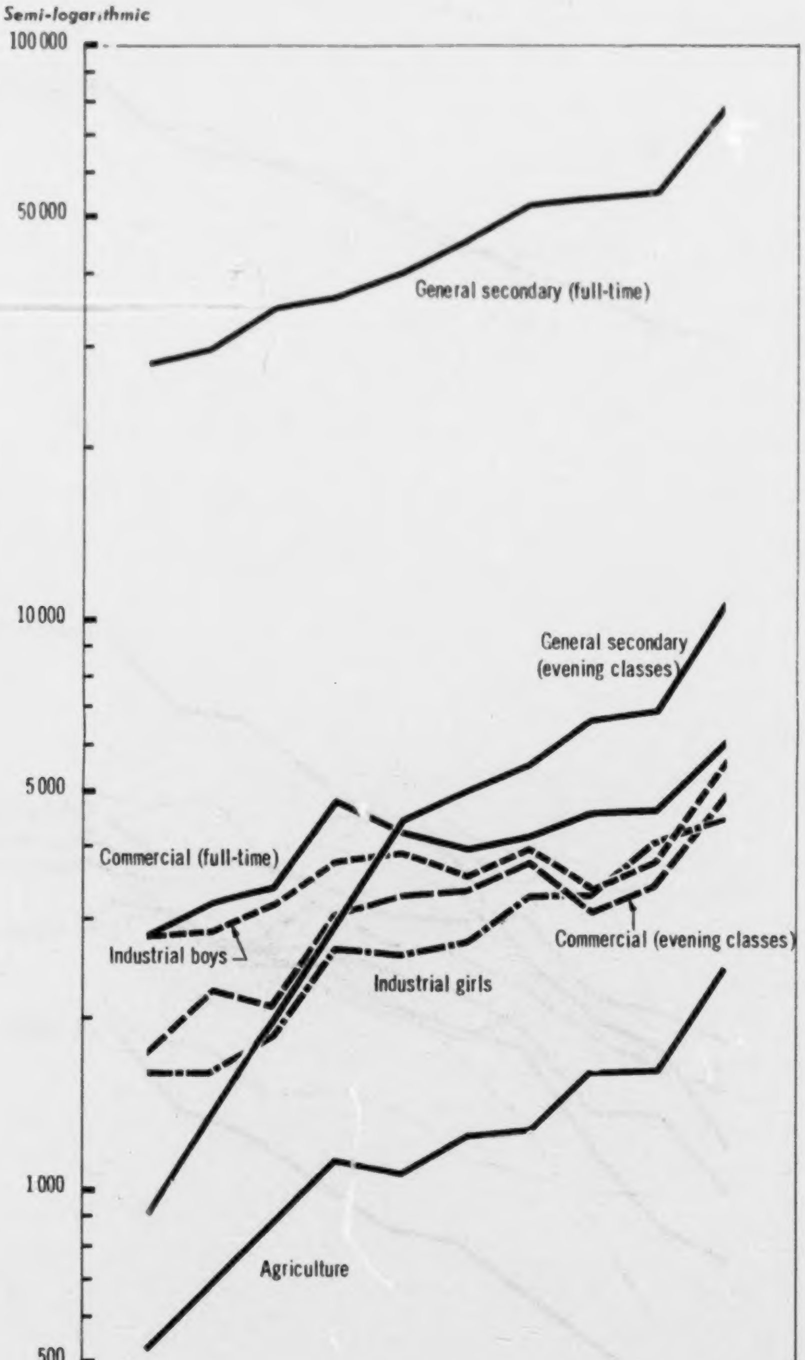


Diagram 2-16

TRENDS OF SCHOOL POPULATION IN THE TOP FORM OF SECONDARY SCHOOL BY TYPE OF EDUCATION, 1955 TO 1964

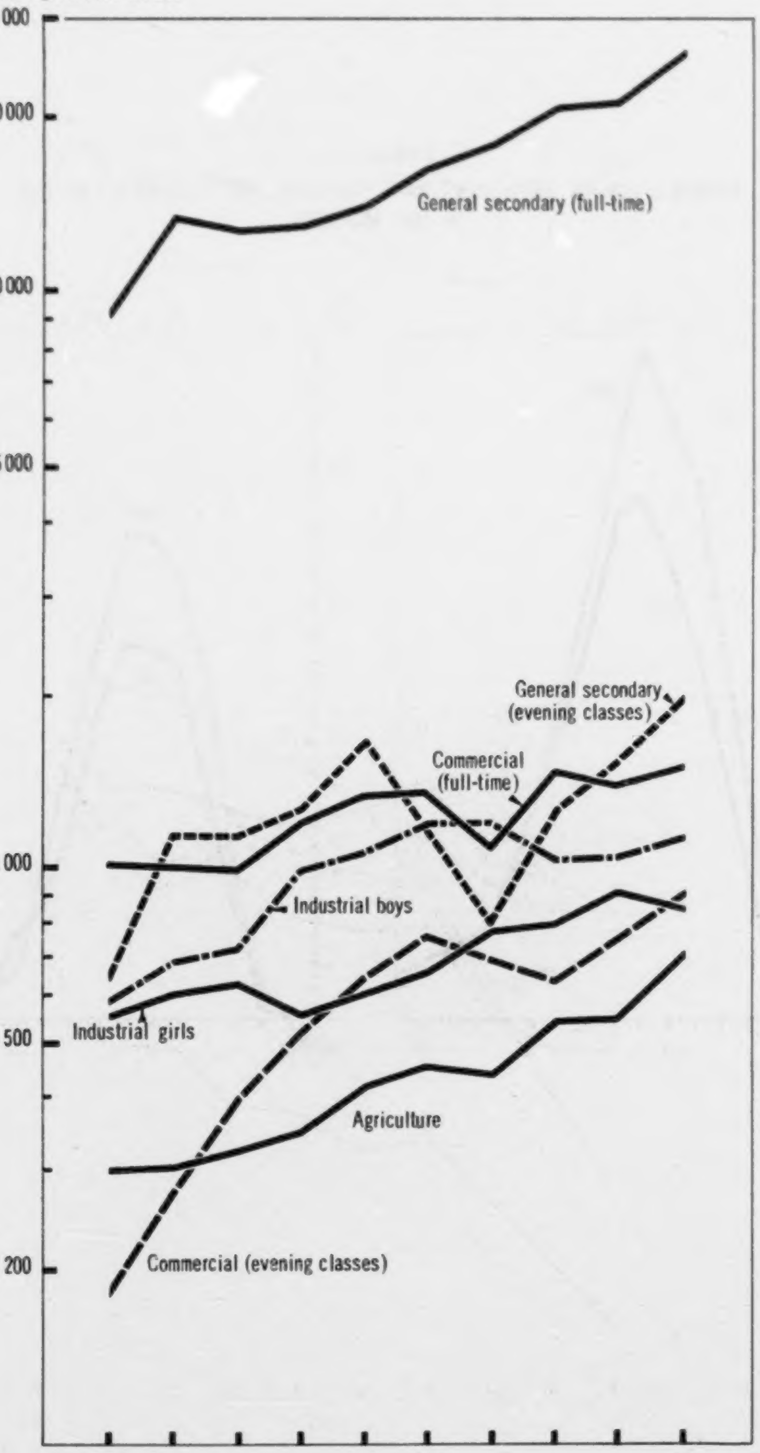


Diagram 2-17

OVERALL SCHOOL ENROLMENT RATE (GENERAL AND TECHNICAL) BY SEX, IN 1961 AND 1964

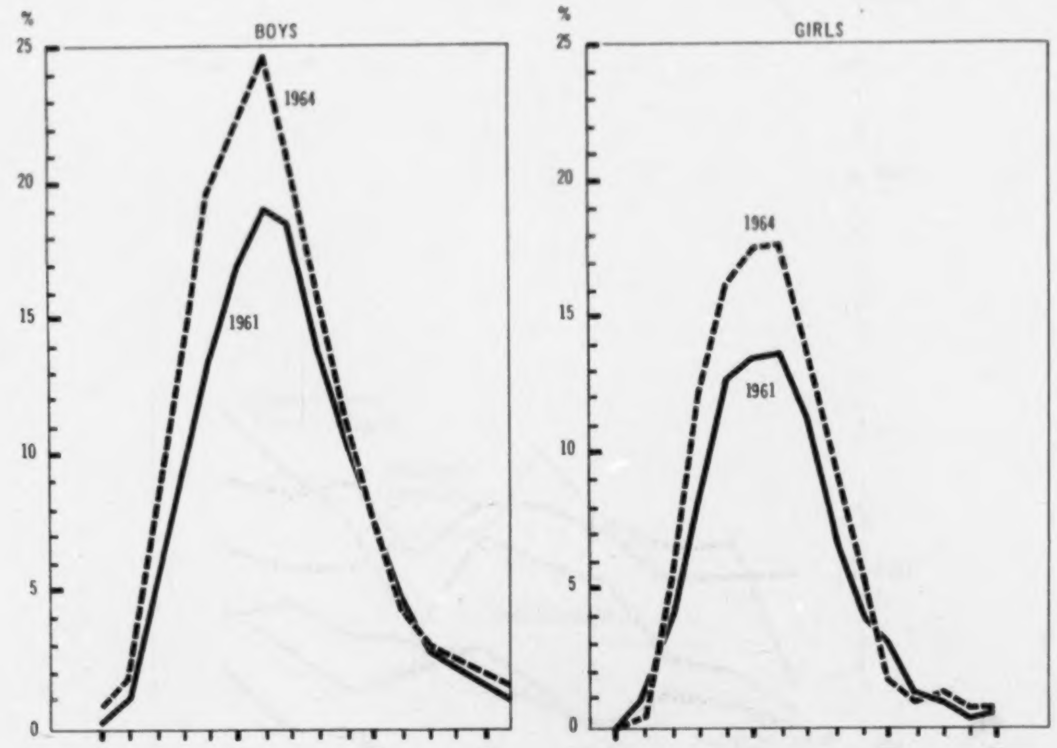


Diagram 2-18

TRENDS OF SCHOOL POPULATION IN HIGHER EDUCATION, BY FACULTIES FROM 1955 TO 1964

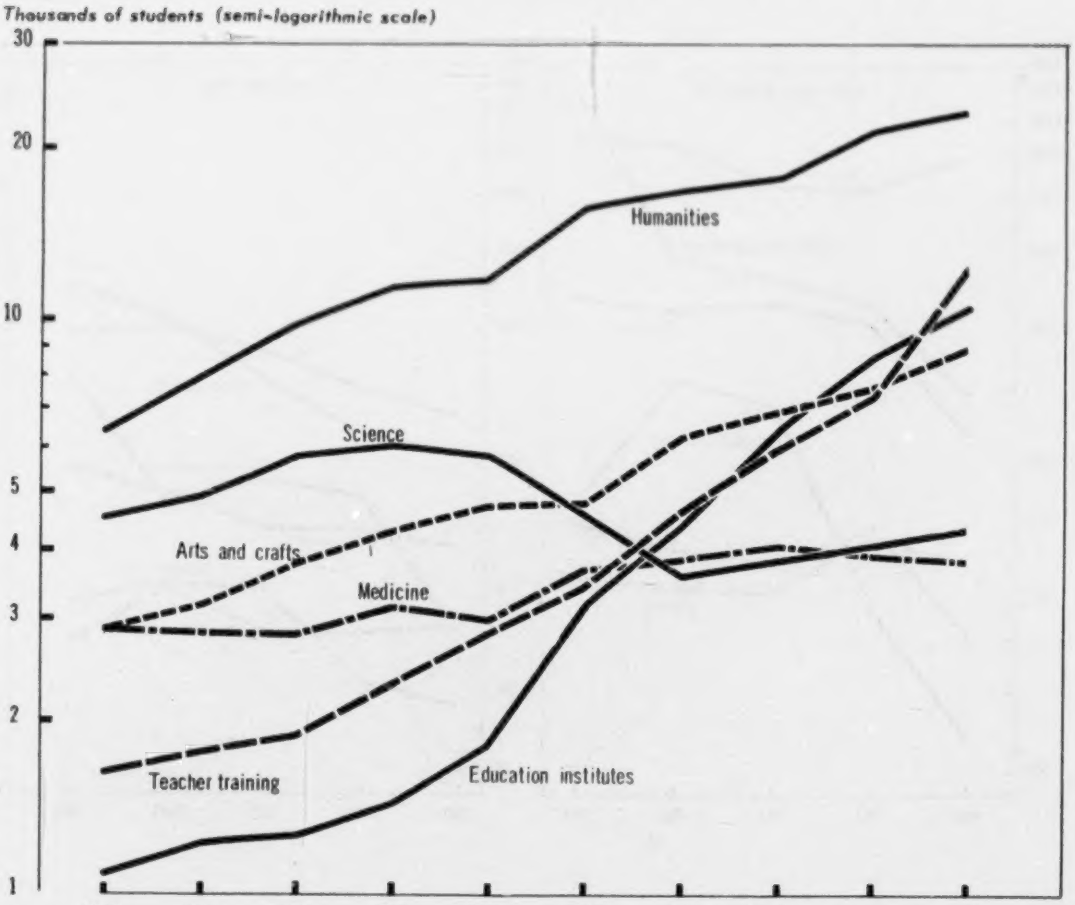
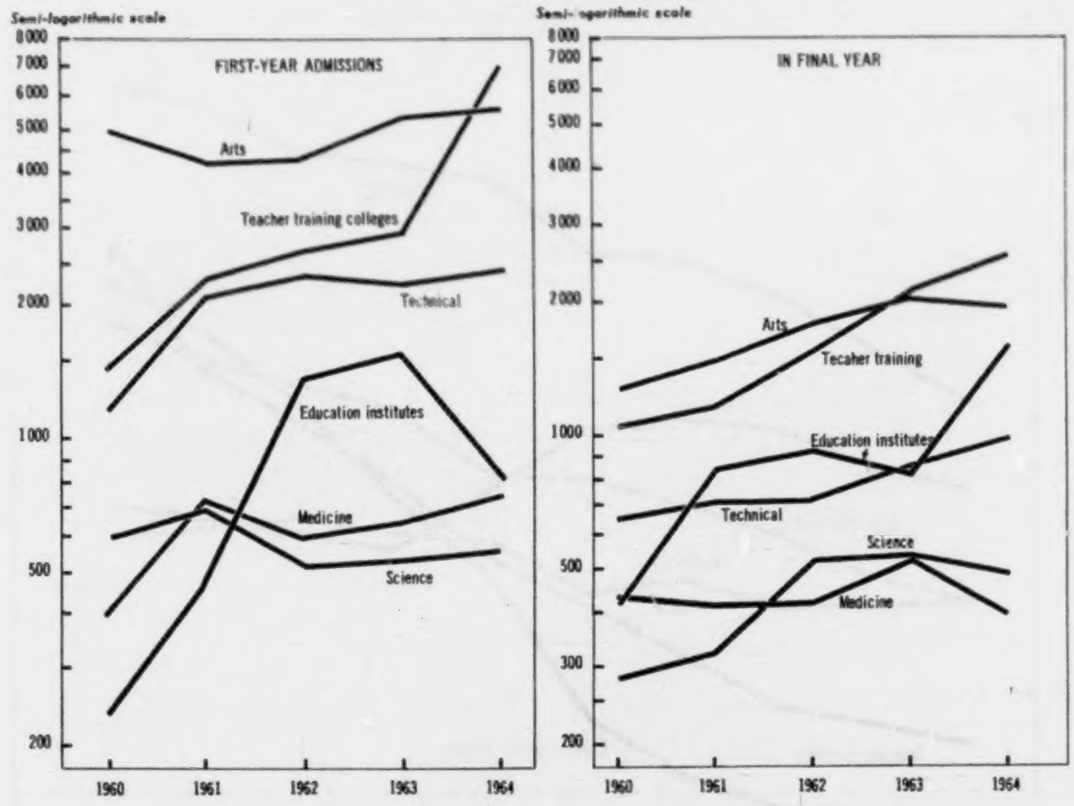


Diagram 2-19

TRENDS OF SCHOOL POPULATION IN FIRST AND FINAL YEARS
OF HIGHER EDUCATION, BY FACULTY, 1960 TO 1964



secondary education. During this period, the number of training colleges rose from 34 to 86 and of universities from nine to 26. Concurrently, the intake of girls into higher education was accelerated. The sharp increase in enrolment is attributable to two factors: first, the rising number of those obtaining school-leaving certificates at secondary level (12.6 per cent increase per annum from 1959 to 1963) and the resultant social demand; secondly, the proliferation of higher education establishments, under the pressure of local interests. Two further factors have accentuated this trend: the total absence of fees and the better working conditions and promotion prospects for teachers offered by the new regulations. Considerations of social prestige have also greatly influenced the development of higher education; for instance, rural colleges for training primary teachers have been assimilated to the urban training colleges.

Now that this differentiation is a thing of the past, these establishments are asking to be raised to the same status as that of the training colleges for secondary school teachers. Some technical colleges have succeeded in obtaining the status of university; some universities have established outside colleges and these, in turn, have gradually acquired independent university status. In view of the enormous surplus demand for admission to State training colleges and universities, the private sector in turn is beginning to show some interest in the creation of higher education establishments.

Table 2.08

TREND FOR POPULATION IN HIGHER EDUCATION (GENERAL AND TECHNICAL STREAMS) FROM 1955 TO 1964

Year	Number of pupils (thousands)	% of boys	% in State schools	Average annual increment (%)				
				Total	By sex		By sector	
					Boys	Girls	Public	Private
1955	20.2	76.3	97.8					
				11.3	9.6	16.1	11.4	6.5
1960	34.5	70.7	98.3					
				16.5	14.8	20.0	13.8	83.0
1964	63.5	66.6	89.3					

This process has taken place very rapidly without regard to the country's overall requirements. Moreover the same factors lie at the origin of the large scale emigration of Peruvian students who prefer foreign universities, and of highly skilled personnel in search of better prospects; at the same time, the expansion of production in general compels the country to import an increasing amount of highly specialised manpower.

This speeding up of the growth of higher education has not gone hand-in-hand with a corresponding expansion of intermediate-level courses. Recently such a trend has set in, but there is a large deficit and the problem will get worse (cf. Chapter 3). At this level the State School of Electronics came into being in 1963; in 1964 a School of Technology was established on the joint initiative of the National University for Engineering, the United Nations Special Fund, and the "Intermediate" Section of the "José Pardo" National Polytechnic College under the Ministry of Education. The first of a series of agricultural colleges established by agreement between the University of Agriculture and the Ministry of Education began to function in 1965. The Ministry has approached the World Bank for the financing of a network of polytechnical and regional colleges (the latter controlled by the universities). As can be seen, the outlook is now better, but attention should be drawn to the danger of disorderly growth at such an important level.

Generally speaking, none of the teacher training branche or specialities have been expanded on the basis of forecasts of requirements of teaching personnel. Primary-teacher training colleges, whose admissions in 1963 numbered 996 men and 1,879 women, had suddenly to be extended in 1964 to cope with an intake of 2,744 men and 4,061 women, or a total first-year enrolment of 6,805. Allowing for a pass-rate of 85 per cent, by 1968 there will be 5,784 applicants for teaching jobs, without any possibility of guaranteed full employment, unless a good many can be induced to settle in the remoter districts of the country where they would replace unqualified staff. Unfortunately, the suggestion made by the committee set up in 1956 for the reform of teacher training (at a time when there were only 23 teacher training colleges) namely, that training be organised on a regional basis, was not adopted and instead of a few large regional training centres about a hundred colleges have sprung up, mostly small and unprofitable, inadequately provided with resources of any kind, and unevenly distributed throughout the country.

For training secondary school teachers, in addition to the university three-year courses (specialised after a two-year optional general course) the Ministry of Education has four-year courses in the advanced training colleges; these grant the same degrees as the three five-year courses, no difference being made in the work carried out or in the specialisation. In 1960, secondary teacher training colleges were attended by 97 students and the university departments of education by 1,424, the corresponding figures for 1964 were 371 and 3,707. In view of the different length of the courses, 294 new entrants to the colleges in 1963 and 3,707 to the university faculties in 1964 will mean, allowing for pass-rates of 85 and 80 per cent respectively, 3,216 graduate teachers coming down in 1966 and seeking posts in 1967. Here, too, the possibility of guaranteed full-time employment is even more remote in that the regulations and promotion system for teachers entitle holders of a teaching diploma to occupy a full-time post. The situation concerning the specialities of teachers in general secondary education is not precisely known, but deserves to be studied because of the seriousness of the problem of the already foreseeable shortage of science teachers in the face of a rapidly growing demand (cf. Chapter 4).

There is serious stagnation in the training of technical teachers, and the failure to plan has meant that for some years the admission of new students has had to be suspended. In view of the rapid increase in technical education, the development of an "intermediate" stage and the powerful boost to be given to technical subjects according to development plan forecasts, we have here a danger that ought to be urgently analysed in the light of the new slant to be given to professional training at elementary, secondary and intermediate levels.

There has also been - except in 1964 - stagnation in the training of physical training instructors, for whom there have been no forecasts nor any attempt made to analyse the essential demand factors. For instance it is not clear whether the physical training lessons in primary schools should be given by the ordinary teacher, or what functions should be assigned to teachers and specialists in the organisation and supervision of sports and recreational activities at the various levels.

The upward trend in university education has been amazing. To the seven State Universities which existed in 1955 have been added

21 new ones over the past ten years, including eight privately owned, and one affiliated college. This expansion has affected 20 towns in 15 of the country's administrative departments (see Annexes). While these are main urban centres, it is noted that the distribution of the universities does not correspond to the eight socio-economic regions proposed in 1965 by the National Planning Institute under its second hypothesis; in fact, in six of the regions there are already obvious cases of overlapping, while the existing universities are able to fulfil their proper regional function only in two centres (Iquitos and Cuzco). It is obviously necessary to have a suitable plan for their general location, as proposed by the Inter-University Council in 1964, to achieve a more integrated system of universities in Peru and avoid the proliferation of new ones. In this way, the universities would be more effectively geared to the process of socio-economic growth.

We referred earlier to the steep rise in the number of secondary graduates, and to the high percentage of those going on to higher studies. We should add that the career opportunities offered by the universities have been established independently, usually on the basis of internal or local considerations and without any appropriate consideration of the specialised or regional role each university should have concerning the national targets set for training university graduates.

Hence we find at national level that arts courses continue to attract the greatest number of students, with a steady rate of expansion over the years, and that during the past five years there has been an unusual increase in the number of candidates for the education departments, which now come second. In contrast, among the other types of advanced training (which are the most costly, the most highly technical and the most exacting) the engineering departments are expanding at a normal rate whereas the medical faculties remain practically stationary and the number of science students is declining. These trends have brought about a visible deterioration in the structure of the student population: whereas in 1955 the number of students in colleges of education, faculties of education and faculties of art amounted to only one half of total enrolment, in 1964, the percentage was 73.4 per cent. Only two universities (the National University of Engineering and the University of Agriculture, both at Lima) have full-scale development plans, accompanied by long-term forecasts of numbers of graduates; some other universities have started similar studies but most frequently nothing has been done, any surveys being usually confined to particular faculties or to such matters as architectural lay-outs, building schemes, and the pruchase of equipment.

The main object of the competitive entrance examinations has been to classify university candidates in order of priority. The number of candidates rose steadily from 12,305 in 1960 to 26,374 in 1964; of these, 4,479 in 1960 and 7,968 in 1964 were declared to have "matriculated" (the highest figure being 9,072 in 1963). However, admission is still subject to the intake capacity of each university or each occupational branch. While a matriculated student is not necessarily admitted, because there may be even better qualified applicants for the available university places (a principle which is not very readily grasped by the applicants, and constantly gives rise to grievances) there are fears that some universities may lower admission standards because of a shortage of suitable candidates. Nor does the candidates' choice among the various careers offered correspond to the forecasts of any vocational guidance programme, each applicant making up his mind on the basis of the limited information he has regarding the labour market. In this respect there is a clear breach of continuity between the secondary schools and the universities, and only very half-hearted attempts are made to bridge it by collective vocational guidance in the schools or recruiting campaigns at higher education centres. The disproportionate growth of would-be teachers shows that plenty of candidates were forthcoming as soon as working conditions and career prospects were improved. Taken in conjunction with shorter courses of study and lower entrance standards, these improved conditions have led to such a steep rise in intake that there will very soon be a sizeable surplus of teachers. Similar motives also induce many students to opt for careers generally reputed to offer high income prospects, without their being precisely informed as to the real possibilities open to their ability, or of the probable market trends and working conditions in specific professions.

According to an opinion widely held among teachers responsible for university entrance examinations, the increase in the number of secondary graduates has led to a decline in the average standard at this level. Since concurrently the percentage of school leavers wishing to enter the universities is rising, there is an acute crisis concerning the preparatory standard of young people going on to higher education. In addition, there is a total lack of coordination between the curricula of the two stages. Whereas general secondary education aims, without any pretence of vocational guidance, at diversification and specialisation in its second cycle, the universities appear to want to organise an initial cycle of general background studies. Accordingly, some faculties have been less exigent than others and their entrance standards are more like those for admission to secondary school. These factors undoubtedly affect the qualitative growth of university education.

2.1.2. Future of graduates

From the standpoint of manpower training, the graduate at any level of education theoretically has a choice between three options: seeking a job, continuing his studies at a higher level, or doing neither one nor the other.

For graduates seeking employment, the most serious problems are due to the fact that their academic certificates or degrees do not correspond to the demands of the economy. The school system has set itself no targets, and any quantitative expansion policy it may have is based simply on forecasts of new and total enrolments (volume of services to be provided). Teaching establishments seldom worry about the eventual fate of their graduates, or offer them placement services which would bring out the need for correlating training with the country's manpower requirements and orienting it according to the state of the labour market, or make a critical analysis of the training provided, improve its standard and enhance the social prestige of education. A placement service of this kind would give each establishment better possibilities of obtaining greater financial aid.

Certainly, general education whether primary or secondary, as at present conceived does not prepare young people to enter employment; this shortcoming has persisted and is now aggravated by the failure rates recorded at both levels; obviously, in view of the general character of the teaching provided, this will always have to be supplemented by an accelerated course of vocational training for people who have to earn their living as soon as they come on the labour market. In future, this group will grow as primary education becomes general, secondary education expands and the pass-rates for both levels increase. There is very little possibility, however, for those leaving primary school to receive any complementary vocational training under the present educational system. There are some vocational and handicraft training courses, but they are few, and are independent of the primary school. The syllabuses for technical primary education provided for in Articles 188 to 196 of the Public Education Act have not yet been prepared; vocational training outside the schools is increasing, however, either in the form of factory courses organised by firms or various public bodies, or of apprenticeship training at national level (SENATI). This trend on the part of firms to train more of the skilled manpower required for expansion has not yet been used by the educational system to reorganise its courses so as better to divide the work of training between in-school and out-of-school training.

The general education provided in secondary schools does not prepare the pupils to take an active part in the economy although, until quite recently, most of them went straight into jobs on leaving school. The general view - confirmed by the experience of labour exchanges - is that secondary school leavers are not equipped to take advantage of the employment possibilities corresponding to their standard of training. They resign themselves to accepting very modest jobs, in which they start as apprentices or attend accelerated vocational training courses financed by firms. It seems, at this level, that education has been organised mainly to prepare adolescents for higher education although, in practice, only half of those leaving secondary school go on to higher education. The results of university entrance examinations moreover show the training received to be inadequate. The specialisations chosen in science or arts in the second cycle of general secondary education clearly show that students prefer scientific subjects, but the failure rate implies that the choice is not based on an accurate appraisal of abilities. For reasons of economy, many private schools offer their pupils only one speciality. University entrance examinations do not take into account the diversification of general secondary education, and tend to lower their standard to that of the first cycle of secondary education, a practice which encourages the creation of a common cycle of general study. On the other hand, the limited experience in Peru of "intermediate" training courses shows that pupils graduating from the general secondary schools are superior to those from technical schools in adaptability, basic education and, certainly, in their methods of working.

The results of the population census of 1961 show that the future of pupils graduating from the secondary technical schools is very uncertain when they enter the labour market. The traditional pattern of technical specialisation, inadequate training and the vagueness of occupational aims, all create serious difficulties for job seekers. Lack of contact with industry and of recruitment services in technical institutes has caused many secondary technical graduates to enter the civil service, which is already over-staffed, or else to become technical instructors and this creates a vicious circle which is exceedingly harmful for this type of training; in the absence of any restatement of training aims, in view of the career possibilities for school-leavers, the technical schools are making a very meagre contribution to the supply of skilled manpower. The sort and level of job most of these graduates accept was not provided for in the schools' training schemes.

Table 2.09 gives a breakdown by occupational category and sector of those who, according to the population census of 1961, declared they had completed the fourth or fifth year of the second cycle of technical secondary education and now form part of the active population.

The largest group, about one-third, are office workers, although most of these are in low-grade jobs, which is hardly admissible for persons who have had commercial training. About half the total graduates, (49.1 per cent) go into managerial, office or sales jobs; and about one-fifth (19.1 per cent) become manual workers, 12.7 per cent belonging to the semi-skilled or unskilled category. Lower managerial staff represent only 2.3 per cent, and teachers 5.8 per cent. As secondary curricula are not intended as preparation for teaching, this latter proportion seems fairly high, particularly as these graduates have very little teaching experience; a vicious circle is thus created which has a bad effect on vocational training standards. There is a high percentage of "unspecified" occupations (9.3), showing that the "specialisations" in secondary school do not correspond to those on the labour market. Many drift into jobs that have nothing to do with their specialisation, and this may largely account for the apparent plethora of junior managers, salesmen and unskilled workers. An examination of the situation by sector shows that trade absorbs 22 per cent of those who either successfully complete or abandon the second cycle of secondary education. The civil service and education (especially State education) attract 17.3 per cent - a very high figure due partly to the pressure brought to bear on the public authorities to find jobs for graduates who are unable to fit into the private sector. This can be the only explanation, for technical secondary education is not intended to

Table 2-09

NUMBER OF ACTIVE PERSONS WHO HAVE NOT COMPLETED SECONDARY SCHOOL OR WHO HAVE A SECONDARY TECHNICAL CERTIFICATE, BY SECTOR AND OCCUPATIONAL CATEGORY

(Sample of 1961 National Population Census)

OCCUPATIONAL CATEGORIES	Total	Agriculture	Fisheries	Mining	Industries	Construction	Energy	Transport	Commerce	Banking	Civil Service	Teaching	Other services	Not specified
Scientific and technical Personnel	50	50	-	-	-	-	-	-	-	-	-	-	-	-
Top level non-scientific and non-technical personnel	3766	100	10	115	385	40	26	90	680	280	300	1150	350	240
- (Teachers)	1136	-	-	-	5	-	1	-	-	-	5	1120	5	-
Intermediate staff	452	100	-	30	25	20	2	10	-	-	60	20	145	40
Administrators, managers, agents	1347	150	5	45	250	40	22	40	410	70	130	10	125	50
- (Junior grade)	391	-	5	25	50	10	11	30	100	60	65	-	5	30
Clerical workers	6580	100	35	230	795	90	55	210	1630	730	940	220	665	880
- (Junior grade)	4578	50	20	175	530	-	43	130	1120	550	635	185	430	710
Salesmen	1635	-	-	-	50	-	-	20	1420	90	5	-	40	10
Workmen	3713	350	60	150	1750	240	93	350	120	20	155	35	240	150
- (Skilled)	1040	-	15	50	510	120	80	60	40	10	55	10	60	30
Not specified (1)	1815	50	-	10	70	-	5	30	30	10	255	-	5	1350
Military	105	-	-	-	-	-	-	-	-	-	90	-	5	10
Religious	5	-	-	-	-	-	-	-	-	-	-	-	5	-
T O T A L	19468	900	110	580	3325	430	203	750	4290	1200	1935	1435	1580	2730

(1) Including unemployed, persons seeking work and others non-specified

supply the type of training required for government jobs. Of those leaving this level, only 4.6 per cent go into agriculture, 17.2 per cent into industry, 0.6 per cent into fisheries, 2.2 per cent into building and one per cent into fuel and power; 25.1 per cent go into miscellaneous occupations, and this, added to the 17.3 per cent entering the civil service and education, means that there are 42.4 per cent employed in sectors for which they were not trained. Technical secondary education is traditionally divided into agricultural, industrial and commercial departments, but we find that graduates from these departments represented only 0.6, 0.8 and 1.6 per cent of the manpower in the corresponding sectors in 1961.

The over-production of graduates from teacher training colleges will be felt in the short run in the form of a large surplus of primary school teachers. By 1964 there was already a considerable switch-over of candidates from university faculties of education to the training colleges, motivated by the advantages of quicker training, comparable pay and better possibilities for embarking on a career of full-time teaching. Graduates from the State maintained teacher training colleges are entitled to a job as soon as they qualify, but this entitlement will soon be only utopian if the excessive growth in teacher training is not controlled. The 1961 population census showed the ratio of urban to rural students at primary teacher training colleges to be 12 to 1.

The Peruvian universities produce 2,000 art graduates each year, 1,600 secondary school teachers, 1,000 engineers, 500 scientists and 400 doctors, besides providing some part of the training of 2,600 primary school teachers.

The highly specialised character of university training sets fairly strict limits to employment possibilities for graduates. The main difficulties up to now have been due to the fact that university expansion has not been planned to meet national requirements for highly skilled manpower; thus the economy offers university graduates jobs for which no training courses are available in Peru; firms have to import executives and technicians from abroad at the same time as graduates emigrate because of the unsatisfactory prospects for employment and promotion. University graduates also tend, in general, to concentrate in the most favoured regions of the country, particularly graduates of departments of education and medical schools.

Thus no clearly defined policy has been laid down to enable the country to make use of its available resources of skilled manpower. The universities often allow their students to prolong their courses indefinitely or to switch to new ones (a very common practice among law and education graduates) unless they decide, as frequently happens, to abandon study altogether. There is also a danger that the difference in quality of the training offered by the various universities may shortly lead to discrimination when students seek employment. It is estimated that 50 per cent of the country's university population seek their training abroad and that many do not come back to Peru for, having been trained in a different socio-economic situation, they have difficulty in finding employment. Although the possibilities and facilities for higher education and the preparation for advanced degrees are just as excellent in Peru as in other countries, the lack of sensible planning is liable to make the cost of higher studies unduly heavy, or to cause an outflow of human resources which the country needs. This last observation is particularly important in view of the urgent need to train and provide refresher courses for university teachers, especially in scientific and technological subjects, at a time when the Peruvian universities are endeavouring to meet the demand by their own efforts or by means of agreement with foreign universities, but without any overall analysis of the total needs of the Peruvian universities.

Generally speaking there are no placement services for university graduates; there is a marked cleavage between the graduates and the university, because the provisions of university statutes have not been put into effect. Statutorily, the university is defined as a "corporation of teachers, students and graduates" and rules are laid down even for the participation of graduates in the administration of the universities. Apart from the role which placement services might play in improving teaching and enhancing employment possibilities, graduates might be called upon to make a financial contribution to their university in view of the high incomes made possible for many of them by their university studies, which are now entirely free of charge.

The growing demand for education, the remarkable expansion of the school system and the possibility of access for everyone to the various levels of education, plus such other factors as the Free Education Act, have helped establish the conviction that primary education should necessarily lead to secondary education, and eventually to the university. Public opinion now considers that the existence of candidates for whom no places are available in secondary schools is a problem of "overflow", and a similar view is being taken of university admission; in recent years the pressure exerted has led to a disproportionately large number of pupils in secondary and higher education as compared with the number graduating a few years ago, as if the sole aim of primary and secondary education is to train potential university students and feed into industry and commerce only the fairly large contingent who abandon their studies.

2.1.3. Human resources and their utilisation

2.1.3.1. Characteristics of the teaching staff

In 1961, teachers represented more than 1.7 per cent of the active population and are thus potentially an important section of the middle classes in view of the strategic position they occupy, for example in the application of a policy for the redistribution of income. However, over half the existing teachers have not had any training in education, and even in the public sector, where a limited amount of research has been conducted into the posts occupied for a review of salary scales, there are insufficient data concerning the composition of teaching staff.

It is not easy to compare the figures obtained in 1961 with the statistics for teachers, because they relate only to persons having declared teaching as their principal occupation (1.7 per cent of the total labour force) whereas the statistics concern the number of persons employed in teaching establishments, any individual being counted once for each school in which he teaches. Table 2.10 and Graph 2.20, which show teacher trends according to the educational statistics for 1955-1964, indicate a substantial increase, from 41,364 in 1955 to 93,426 in 1964. The average annual growth rate for the main branches were: 6.9 per cent in nursery and primary schools; 10.8 per cent in general secondary schools; 9.6 per cent in secondary technical schools; 17.2 per cent in teacher training colleges, and 11.6 per cent in the universities. In nursery and primary schools the proportion of male teachers (35.3 per cent) is comparatively high, although they are in the minority; generally speaking, this signifies that teachers' salary scales are competitive with those of other jobs; conversely, at intermediate and higher levels, male teachers are in the majority (62.4 per cent and 88.9 per cent respectively): this situation is likely to change as more girls are able to go on to advanced studies.

Diagram 2-20

TEACHER TRENDS BY LEVEL AND TYPE OF EDUCATION 1955-1964

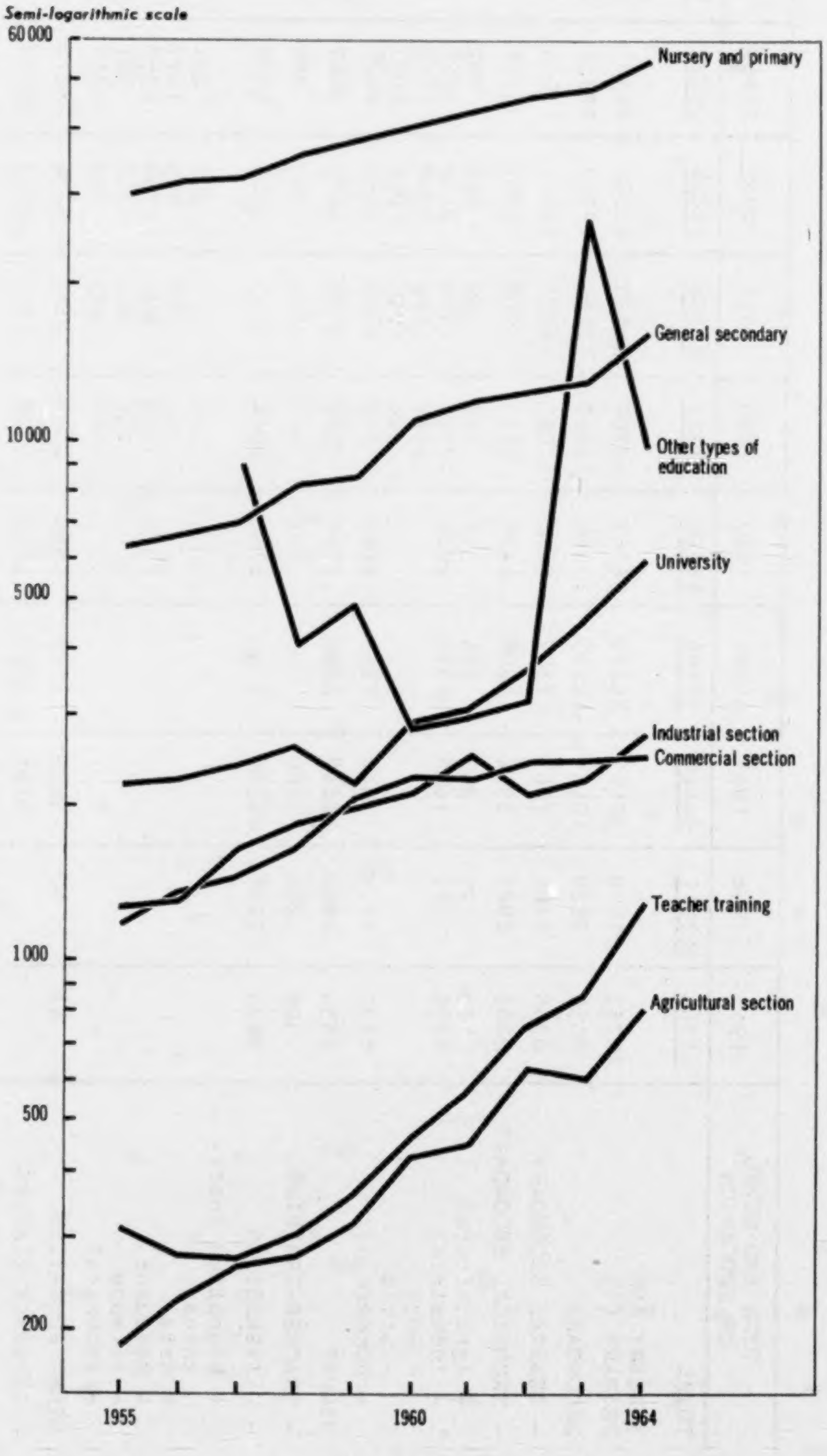


Table 2-10

TEACHER TRENDS, BY TYPE AND LEVEL OF EDUCATION, 1955-1964

TYPE AND LEVEL OF EDUCATION	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
TOTAL	41364	43911	54448	54396	58846	62781	67508	71444	99028	93426
NURSERY AND PRIMARY (1)	29753	31679	32117	35258	38369	40700	43553	45902	48405	54226
SECONDARY	9034	9629	10435	12113	13044	15848	17219	17783	18338	22133
- GENERAL SECONDARY	6366	6706	7063	8307	8662	11017	12001	12574	13010	16043
- TECHNICAL SECONDARY	2668	2923	3372	3806	4382	4831	5218	5209	5328	6090
- Agricultural	185	227	263	274	318	425	450	628	602	817
- Industrial	1292	1312	1645	1871	2002	2114	2498	2109	2256	2760
- Boys						1188	1549	1097	1173	1557
- Girls						926	949	1012	1083	1203
- Commercial	1191	1384	1464	1661	2062	2292	2270	2472	2470	2513
HIGHER	2534	2560	2667	2896	2545	3378	3709	4485	5467	7288
- TEACHER-TRAINING	309	274	269	303	355	464	574	761	868	1293
- UNIVERSITIES	2225	2286	2398	2593	2190	2914	3135	3724	4599	5995
- Education institutes						157	171	203	224	455
- Arts						742	769	883	1019	1498
- Medicine						833	920	1308	1355	1484
- Science						736	802	752	791	856
- Technical						446	473	578	1210	1702
OTHER EDUCATION	43	43	9229	4129	4888	2855	3027	3274	28818	9779
- LITERACY CLASSES			9181	3967	4833	2778	2913	2903	26410	9097
- CRAFTSMANSHIPS	43	43	48	48	55	77	114	133	140	293
- REFRESHER COURSES				114				238	268	389

(1) Including primary education for adults.

Sources: Division of school statistics of the Ministry of Education and of the National Bureau of interuniversity planning.

In 1964, State schools employed 72.3 per cent of the total number of teachers. In private schools, although the Education Act states that only certificated teachers may be employed, this is insisted upon only when official application is made to open a school; once authorisation has been given, private schools frequently recruit uncertificated teachers since there is no longer any government inspection.

The 1961 census provides some general information on the qualifications of the teachers in the various educational levels. Data are summarised in Table 2.11.

At primary level only 32.9 per cent of the teachers had had any teacher training; 15.1 per cent had attended elementary school only, and 46.4 per cent had been to secondary school. The census also furnished proof that for every 100 teachers who had attended training college, 92.2 were living in urban areas. In other words, the Peruvian educational system has not yet succeeded in developing teacher training for rural areas, and in offering teachers sufficient incentive to induce them to take up jobs in the more remote rural areas.

In general secondary education 52.2 per cent of the teachers have had training in education, including 12.6 per cent who are graduates of primary teacher training colleges seeking part-time employment in secondary schools; 25.1 per cent of the teachers are graduates of the arts faculties and provide serious competition for graduates from the pedagogical institute and who represent only 39.6 per cent of the total number of teachers.

In technical secondary schools the system does not lend itself to vocational training. In this branch, 23 per cent of the teachers have attended a technical secondary school, 13.7 per cent a teacher training college, 2 per cent a pedagogical institute and 4.4 per cent a school of engineering; 12.9 per cent have only primary education, and 27.8 per cent come from general secondary school.

In spite of these limitations, the average educational level of teachers (10.4 years of school attendance and examinations passed) is higher than that of any other socio-economic sector (cf. Chapter 3).

The 1961 census also shows the breakdown of teachers by age (cf. Table 2.12). There is a high proportion of younger teachers aged 25 to 44, even at university level, as a result of the recent

Table 2-11

BREAKDOWN OF TEACHERS FOR EACH LEVEL AND TYPE OF EDUCATION, BY EDUCATIONAL STANDARD

(Sample from 1961 Census)

Educational standard of teacher	EDUCATIONAL LEVEL					
	Nursery and Primary			Secondary		University
	Total	Population urban (1)	Population rural (1)	Classics	Technical	
TOTAL	100	100	100	100	100	100
PRIMAIRE	15.1	12.0	27.4	1.0	12.9	-
SECONDAIRE	46.5	43.5	58.1	8.1	50.8	-
- General	43.3	40.3	54.8	7.0	27.8	-
- Technical	3.2	3.2	3.3	1.1	23.0	-
HIGHER	36.1	42.0	13.2	85.7	27.4	97.9
- Normal	31.4	36.5	11.8	12.6	13.7	2.2
- University	4.7	5.5	1.4	73.1	13.7	95.7
- Education	1.5	1.8	0.3	39.6	2.0	9.2
- Arts	2.5	2.9	0.9	25.1	6.9	29.7
- Medicine	0.2	0.2	0.1	1.5	0.4	13.5
- Science	0.3	0.3	0.1	3.0	-	14.1
- Technical	0.2	0.3	-	3.9	4.4	29.2
OTHER FORMS OF EDUCATION	1.3	1.4	0.7	2.8	7.7	0.5
NOT SPECIFIED	1.0	1.1	0.6	2.4	1.2	1.6

(1) According to the area where the teacher was living at the time of the census.

Table 2-12

BREAKDOWN OF TEACHERS BY LEVEL AND TYPE OF EDUCATION, ACCORDING TO AGE GROUP

(Sample from 1961 census)

	AGE GROUPS			
	Total	15 - 24	25 - 44	45 and over
TOTAL	100	16.7	63.4	19.9
Normal school	100	10.9	70.4	18.7
Instructor	100	10.0	73.0	17.0
Others	100	19.9	59.4	20.7
NURSERY AND PRIMARY	100	18.3	62.3	19.4
Normal school	100	11.2	70.2	18.6
Instructor	100	17.6	61.6	20.8
Others	100	21.6	58.7	19.7
GENERAL SECONDARY	100	9.7	69.6	20.7
Normal school	100	5.5	72.4	22.1
Instructor	100	8.5	75.8	15.7
Others	100	11.9	63.6	24.5
TECHNICAL SECONDARY	100	17.7	60.5	21.8
Normal school	100	20.6	73.5	5.9
Instructor	100	20.0	40.0	40.0
Others	100	17.2	58.9	23.9
UNIVERSITY	100	1.6	65.4	33.0
Normal school	100	-	75.0	25.0
Instructor	100	5.9	64.7	29.4
Others	100	1.2	65.3	33.5

expansion in higher education. Similarly the proportion of young teachers is higher among those who have attended training centres. The proportion of teachers under 25 is also high in nursery and primary schools, and in technical secondary schools, 18.3 per cent and 17.7 per cent respectively. Although, on the whole, teachers tend to be fairly young, the possibility for teachers in State schools to be released after seven years' service, retirement after 25 years' service for women and 30 for men and the fact that the years spent in teacher training count towards entitlement to a pension are so many factors which affect the maintaining of an active body of teachers and which induce substantial numbers to give up teaching fairly early but at the same time to form a reserve that could be drawn upon if circumstances require and sufficiently attractive benefits are offered (as, at the present time, assimilation to higher salary scales).

2.1.3.2. Teachers' working conditions

There has been a decided improvement in teachers' working conditions but no parallel effort has been made to standardize teachers' duties in order to rationalise posts and make more efficient use of this vital manpower.

In 1964, Act No. 15.215 on the status and promotion conditions of teachers was promulgated, standardizing professional requirements, salaries and duties. The new regulations ensure sufficiently attractive working conditions to keep the most capable teachers in the profession by guarantees concerning pay, stability, career prospects and promotion according to ability and merit; these are assessed technically by very decentralised boards comprising representatives of the trade unions. The new salary scales established in application of the Act are more attractive, and represent a decided improvement over the old scales. Unlike the traditional system of sporadic adjustments, since the Act, scales have been established in terms of a basic salary (automatically adjustable every year according to fluctuations in the cost of living); they also include various allowances and fringe benefits provided by the modern welfare legislation (seniority and special responsibility allowances); proficiency bonuses, allowances for cost of living, housing, merit, and family dependants. Teachers are affiliated to the social security system for wage-earners; they are allowed leave of absence for sickness, trade union activities and refresher courses; they benefit from mutual aid services, co-operatives and credit funds, union rights, etc.)

Peruvian teachers in State schools are entitled to a severance pension after seven years' service, and to a full retirement pension after 25 years' service for women and 30 for men (including the time spent in teacher training centres or in service in private schools). Teachers' pensions are automatically readjusted in line with any changes in the basic salary of serving teachers; retirement pensions (like teachers' salaries) may be paid while the recipient has other gainful employment or a government pension. Nevertheless there are still extremely serious problems to be solved; the teacher/pupil ratios differ widely according to the level or branch of education. Graph 2.21 shows the ratio of the average number of pupils per post for the period 1960-1964. In nursery and primary education the teacher/pupil ratio has improved over the past two years to about 1 to 40, which is the figure taken as standard for investment programmes. The importance of this ratio at both levels should be stressed in view of its influence on the quality of teaching and on the total educational budget. The net figures are actually higher because many jobs at these levels are occupied by teachers who are not form masters; this is true in particular of the so-called "special" teachers, whose numbers have increased over the past few years. Furthermore, the teacher/pupil ratio varies very considerably either because of the shortage of staff, especially in country areas, or of the inadequate and small classrooms in urban districts.

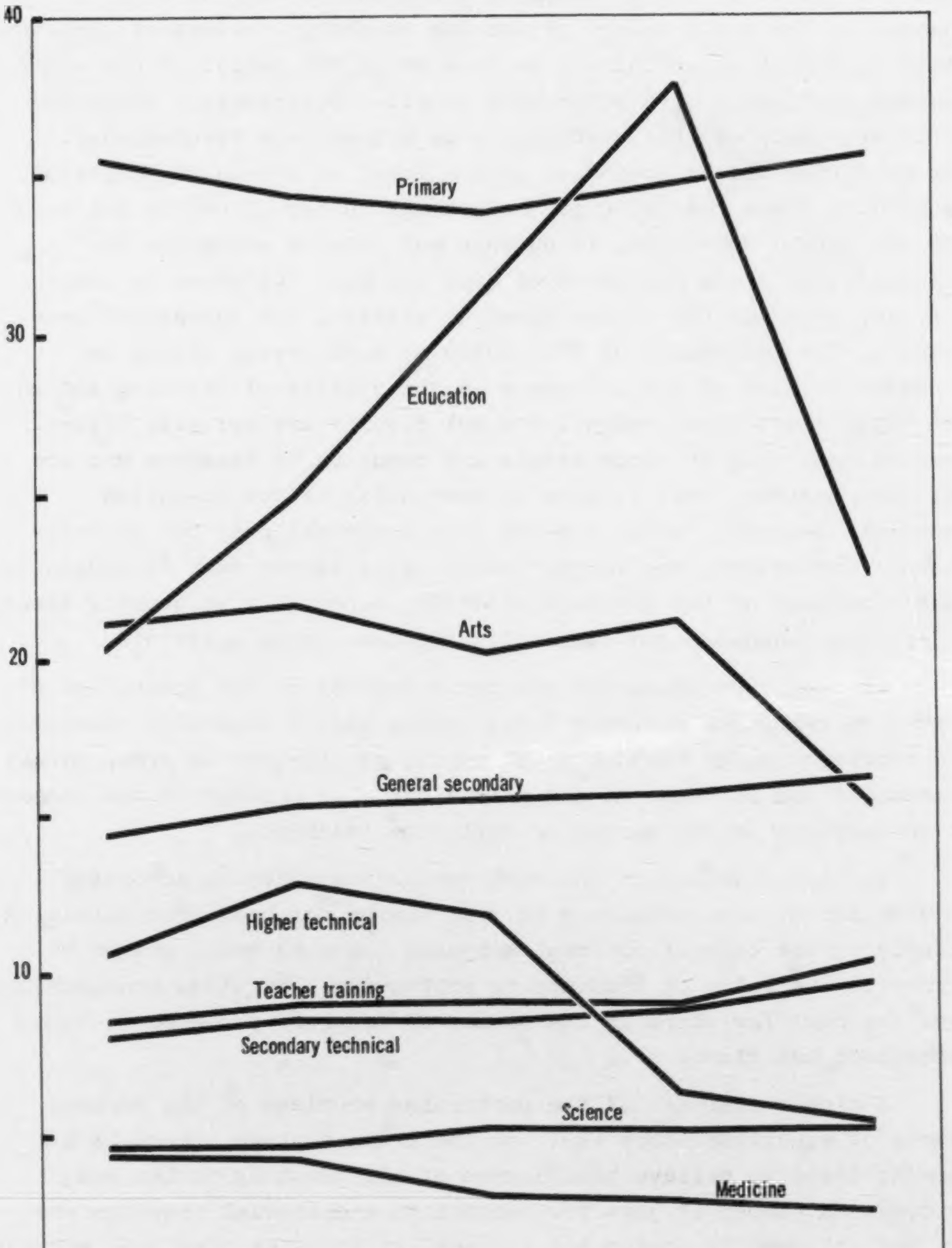
In secondary education the ratio depends on the proportion of part-time personnel employed on an hourly basis. Generally speaking, the tendency is for the number of pupils per teacher to rise, mainly because of the pressure on admissions but also because of the comparative increase in the number of full-time teachers.

In higher education the rate varies considerably according to discipline, some requiring several chairs for each specialisation, notably in the case of optional subjects taken by small groups of students. The ratio of students to professors has fallen considerably over the past few years as the number of teachers assigned to each department has risen.

A closer analysis of the particular problems of the various levels of education shows that, at the primary stage, there is a growing trend to relieve headmasters of all teaching duties and to create a number of jobs for assistants and special teachers who are not attached to particular classes. At the same time some serious problems, such as the subjects to be taught to the aboriginal language-speaking population - Quechua and Aymara - are not receiving

Diagram 2-21

TREND OF TEACHER/STUDENT RATIO
BY LEVEL AND TYPE OF EDUCATION 1960-1964



sufficient attention; there are still one-teacher schools, and plans for the improvement of teaching in general and scientific teaching in particular are being neglected.

In the general secondary schools the most serious difficulties concern the employment of teachers paid by the hour - a system detrimental to the training of young people but which has spread rapidly due to a surplus supply of secondary teachers, the competition of graduates from other professions, and from students or persons without higher education who endeavour by all possible means to obtain a few hours' teaching a week. This practice has induced many qualified teachers to divide their time among several State schools up to the maximum number of hours allowed, and also either to teach for a few hours in private schools or do other work which they would have to give up if they combined their hours and served full-time in a single establishment (as they are starting to do under the new Act on the status and promotion conditions of teachers). The most serious problems arise at general secondary level due to the excessive expansion of schools and to questions of grading among the teaching staff. Under the old salary scales the differences in basic salary between certificated and uncertificated teachers, or between those paid by the hour or occupying permanent posts were so insignificant that there was no inducement for teachers to seek a particular professional status or to stabilize their employment.

In secondary technical schools, the worst difficulties are partly due to the fact that some of their graduates return as teachers either immediately or after taking special training courses for the purpose; in neither case do they acquire the necessary experience for applying their technical knowledge at works level.

This traditional pattern in the technical schools thus tends to perpetuate, in each school, the same type of teaching and timetable previously in use. In teacher training colleges all the staff is qualified and in some cases even has specialist qualifications, but most courses are improvised whenever the subject matter is highly specialised. This practice is detrimental particularly to pedagogical courses and actual classwork in the schools.

In higher education, the rapid growth of the Peruvian universities has accentuated the shortage of teachers already noted over the past five years, especially in scientific and technological disciplines, where new specialised needs constantly arise requiring highly qualified personnel who are often lured away by very advantageous offers from private enterprise. According to the 1961 census, only about one-third of the teachers in higher education look on teaching as their main occupation.

Although there has certainly been a trend in recent years to increase the number of full-time professors, particularly in the older universities, financial difficulties often stand in the way because it is the teachers at the end of their career who are paid most. On the other hand, and mainly in the most recent foundations, the university department staffs have been increased, as well as the number of temporary posts, which are poorly paid.

Hence it is not uncommon for teachers to hold several concurrent part-time jobs in two or more universities. As the State universities have not yet fixed the standard salary scale provided for in the Education Act, each establishment at present has its own scale, depending on the funds available; at the same time an effort is made to pay sufficiently good salaries to attract and keep the most highly qualified staff. Marked pay differentials have in some cases caused staff to switch from one university to another and have given rise to continuous agitation for revised pay scales to bring salaries up to the rates offered in certain universities for the highest categories, as provided for under Act 13417 on the status of universities.

The Act on teachers' status and promotion conditions recognises the right of teachers to form a trade union; it fosters union development by recognising certain prerogatives, notably the right to be represented on the bodies responsible for appraising the efficiency of the educational system. Before the new Act was passed, the teachers' organisations went through periods of intensive trade union agitation to win the rights which are now recognised and formalised by statute. The teachers' claims often created conflicting situations which shook the unity of the trade union movement and did little to help technical progress in education. These unions have recently become stronger and have shown their strength by appointing representatives to various competitive examinations and to a number of technical commissions.

2.1.3.3. Teacher training and refresher courses

We spoke earlier of the lack of coordination between the development of teacher training colleges and the forecasts of teacher requirements to meet the overall and regional demands placed on the education system.

We have also noted a lack of uniformity in the slant given to the training syllabuses for the various levels and branches in the schools under the Ministry of Education in the university and in private schools.

At primary level, while quantitatively satisfactory standards have been achieved, small training colleges, with very limited funds, are being created and which issue the same diplomas as the more advanced training colleges.

The same problem arises for training general secondary school teachers, and is aggravated by the lack of co-ordination between the Ministry of Education and the University. The specialisation of future teachers must also be taken into account. This is a subject about which little is known and which is likely to lead to a serious shortage of science teachers.

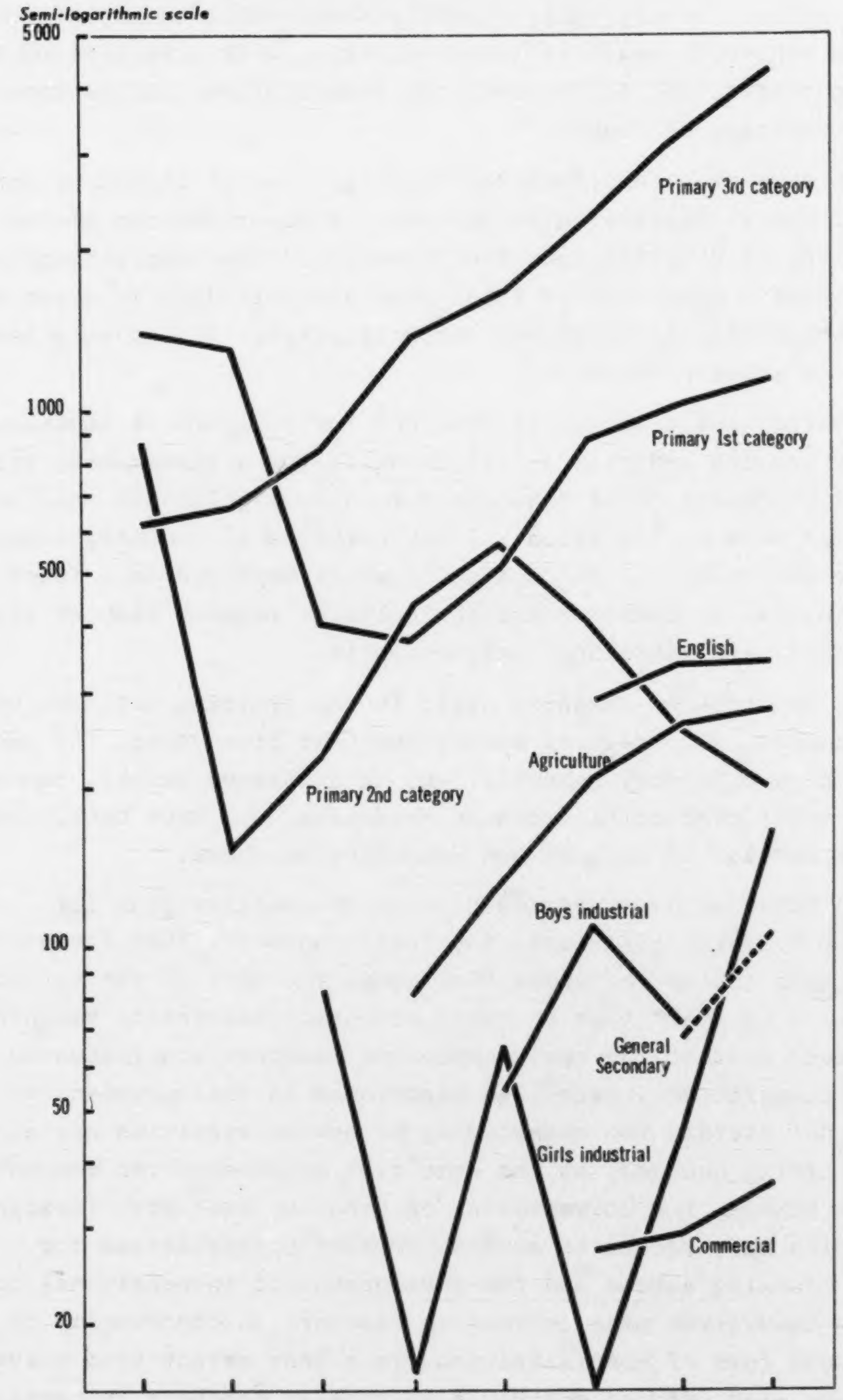
Insufficient training is provided for teachers in technical secondary schools and this situation calls for a fundamental structural reform. Among other measures more direct relations must be established between education and the services in industry responsible for the technical and operative staff employed on a fixed-term contract basis. In commerce and agriculture, regular teacher training courses have been introduced only recently.

The shortage of teaching staff in the training colleges has become increasingly critical during the past five years. The senior colleges have only very recently, and to a limited extent, become aware of their responsibilities in this area, but have continued to swell the surplus of primary and secondary teachers.

The Peruvian universities have no coordinated plan for drawing up training syllabuses for their teachers. They frequently recruit their junior lecturers from among the best of the university's own students to start them on their career in university teaching; nevertheless most of the newly appointed teachers are graduates having a comparatively extensive experience in their respective professional fields. The mushrooming of new universities has also led to staffing changes, at the same time as schemes for teacher exchanges between the universities of Peru and even with foreign universities have tended to expand. Greater possibilities for advanced training abroad and the development of international co-operation have given many university teachers an opportunity to acquire some form of specialisation. To a less extent some universities have also offered contracts to foreign teachers in certain subjects or for highly specialised posts.

Diagram 2-22

TRENDS OF TEACHERS IN SERVICE IN PRIMARY AND SECONDARY SCHOOLS AND REGISTERED AT REFRESHER COURSES, BY LEVEL AND TYPE OF EDUCATION, 1957 TO 1964



In view of the importance of the selection, training and refresher courses of university staff for teaching standards, the university authorities are now convinced that these must no longer be left to isolated or casual initiative on the part of each university and that special syllabuses, drawn up at inter-university level, will have to be adopted. Generally speaking, the organisational plans for new universities and faculties do not take sufficient account of the essential requirements for teaching staff.

Refresher courses for teachers in service have been systematically organised as from 1956, following the elaboration of the national plan for teachers' training and refresher courses. Graph 2.22 shows the number of teachers in post in primary and secondary schools who have taken refresher courses between 1957 and 1964. As can be seen, the scheme is intended mainly for primary teachers; it has enabled training courses to be given to what are known as third category teachers (uncertificated), refresher courses to second category teachers (certificated but without teaching experience) and finally specialised courses to first category teachers (those with teaching diplomas). In 1964, registrations at this level represented 11.7 per cent of the total number of teachers in service; subsequently, similar opportunities were offered to technical secondary school teachers and then to general secondary teachers. Higher salaries and promotion for additional qualifications are important incentives in such schemes.

These training courses have been co-ordinated by the National Institute for Refresher Courses for Teachers, set up in 1956. The system comprises a set of yearly courses each consisting of a first stage in the form of correspondence tuition without the teacher having to leave his job, followed by a second stage of summer schools held in regional centres. In the training departments the syllabuses correspond to those of the official teacher training colleges; the specialised courses however do not follow any specific line of action.

The training courses for teachers in service are also intended to bring professional work up-to-date, modernise teaching methods and subjects taught; apart from the above-mentioned courses, syllabuses have been introduced at the initiative of school authorities and small local groups of teachers, or following regional and national competitive examinations on the results of which candidates are awarded certificates.

Opportunities for training abroad have considerably increased but, generally speaking, the tendency is for all fellowships offered to be taken up regardless of the actual requirements of education. Hence as regards the eventual use made of those obtaining fellowships, these opportunities have made only a limited contribution to the growth of education.

2.1.3.4. Administrative and other non-teaching staff

The absence of standard budgeting procedures has encouraged bureaucracy in both government departments and schools due to the unconsidered creation of permanent posts in administration and general services (cf. Table 2.13).

In the primary schools, it was reckoned in 1964 that there was one administrator for every 18.2 teachers and one maintenance man for every 12.9 teachers. The national averages are low, but in the capital great insistence is placed on the creation of administrative, clerical and manual jobs. In the secondary schools there are even more serious excesses: on the general side there is one clerical worker for every 3.4 teachers (including part-time teachers) and one manual worker for every 4.7 teachers; in the technical departments the comparable figures are 4.5 and 8.5 respectively.

The same trends are found in central administration for, in spite of the establishment of regional directorates, there has been no reduction in clerical and manual staff or structural reform permitting a better adaptation to the new responsibilities. In the regional directorates, posts have been created in equal numbers to those already existing in the central administration, thus leading to costly duplication and quarrels of administrative competence.

In both the Ministry of Education and the universities specialised technical personnel are rare and training and refresher courses non-existent. The delay in modernising education services - due to lack of experience and funds - has not allowed less rigid administrative methods to be introduced; the Government has fallen back on the most expensive solution: that of multiplying the number of administrators.

2.1.4. Capital resources and their utilisation

There is a very serious lack of schools and equipment. It is estimated that only one third of the school population has suitable

Table 2-13

BREAKDOWN OF ADMINISTRATIVE AND SERVICE STAFF IN EDUCATION, BY LEVEL AND TYPE OF EDUCATION, IN 1964

LEVEL AND TYPE OF EDUCATION	Administrative Personnel	Service Personnel
TOTAL	12735	10193
ADMINISTRATION	1800	256
- National	885	176
- Regional	915	80
SCHOOL SYSTEM	10935	9937
- Nursery and primary	2972	4195
- Secondary	6016	4145
- General secondary	4658	3426
- Technical secondary	1358	719
- Agricultural	231	231
- Industrial	668	322
- Commercial	459	166
- Higher	1846	1509
- Normal	337	458
- University	1509	1051
- Education	112	36
- Arts	306	162
- Medicine	212	103
- Science	307	234
- Technical	572	516
OTHER FORMS OF EDUCATION	101	88
- Handicraft section	32	60
- Refresher courses	69	28

classrooms and equipment; in State schools, 33 per cent of the classrooms are located in premises rented to the Government.

Surveys of schools buildings are very few and far between. General estimates were made in 1963, on the basis of the "inventory of Educational Facts" (1956) and the "School Building Programmes" with a view to drawing up a "programme of public investment for 1964-1965". These estimates have been considered only for city primary schools following the survey carried out in 1963 by the students of the faculty of Architecture in the National Engineering University. The findings of other nationwide surveys on the subject are not known, in spite of rough estimates which indicate the seriousness of the problem. However, some important work is to be co-ordinated by the Peruvian "Group for the Development of School Buildings" set up in December 1965, by agreement between the Ministry of Education and CONESCAL.

In nursery and primary schools, 25.6 per cent of the classrooms are not fit to be used and should be replaced, and 38.7 per cent need to be repaired. The situation in particularly critical in the rural areas where only 30 per cent of the school premises are in a reasonable condition. In State schools 32.7 per cent of the classrooms used are on rented premises; in Lima and Callao, 2,150 classrooms are also used for other purposes.

At other levels deterioration is equally serious and, generally speaking, there is no precise knowledge of the number of new buildings, conversions or replacements for 1963, 1964 and 1965; only overall figures are available, notably for costs.

In 1963, it was estimated there were 14,268 condemned classrooms to be replaced and 22,462 to be repaired. To these figures, which presuppose a considerable capital outlay, should be added enormous sums for investment to remedy the present shortage of places in primary schools, and ensure the expansion of other levels of education.

Just as for school premises, only very scanty information is available on the current status of school equipment. Since 1957, there has not been any general stock-taking of property owned by the Ministry of Education. Similar information for the universities is incomplete, and no data are available on the equipment of private schools. In the State primary schools the equipment is inadequate and largely left to the initiative and financial responsibility of the children's parents, who have to meet certain costs of material and minor repairs. Such parental contributions have practically disappeared since the implementation of the Free Education Act but they have not yet been replaced by the proposed budget appropriations.

Each secondary school and teacher training college has its own budget for minor equipment. However, there are general budgets earmarked by the central government for purchases of supplies for schools in general, so that it is very difficult to determine to which level the equipment goes. The small amount of furniture shown to exist by the inventory taken in 1957, and of expenditure under this heading by the Ministry of Education, gives grounds for thinking the situation is highly critical. According to the study (mentioned above) by the faculty of architecture of the National University of Engineering (1963), the average national figures for school furniture for city primary schools were: 0.78 seat per pupil, 0.71 desk and 0.86 blackboard per department. Rough as they are, these figures give some idea of the serious nature of the problem.

In the statistics for State educational expenditure, investment has always represented a very small proportion of the whole (7.7 per cent from 1960 to 1965), for it has always been sacrificed in favour of current expenditure to meet the cuts requested by the Ministry of Finance, and, even during a budget year, investment appropriations are often used for purposes of transfer or economy.

The few investment appropriations actually used were not employed for overall projects for new schools; all that has been done was to establish annual school building programmes, regardless of equipment requirements, primarily intended to convert existing premises. The total work financed has always fallen short of the annual educational expansion, thus rendering the state of the infrastructure even more parlous. The schools are not therefore maintained as they should be, and makeshift buildings are rented for supplementary classrooms.

Neither has any real progress been made in the standardization of designs, or in the more economical or functional planning of school buildings. The lack of uniformity in planning and costs has also prevented the rational use of the existing capacity in each school (e.g. by more flexible syllabuses or planning of school activities). The same applies to the most recent economic plans; at Lima and Callao costly schools working on a double-shift system are still being built, but the buildings and equipment are used intensively for only eight months in the year (the academic year is being constantly reduced). Suitable planning would also have made it possible to avoid having the very small classes frequently found in town districts as a result of the shortage of premises, with the increase they entail in unit costs due to high teacher/pupil ratios.

The department responsible for school building cannot keep pace with demand so long as schemes for new schools throughout the country continue to be centrally controlled from Lima and the overall budgets for school building are administered there. The meagre investment appropriations for education during the past two years have been spent on numerous minor works specified in the annual Finance Acts, their allocation taking no account of the forecasts made for the annual investment programmes. The effect of this practice has been to render nugatory the technical work of the planning departments, fritter away the finances and swamp the administration. The traditional voluntary contribution by the local authority, and government incentives and technical and material guidance during the past three years, have considerably relieved the pressure on classrooms, especially in the more remote districts (4,500 classrooms built or improved during the period) thus mitigating the shortcomings of the centralised services in such regions, though without being able to supply all the requisite school equipment. Local authority contributions have consisted mainly of sites or premises for use as school buildings and construction supervisory services. Regional development corporations have also contributed to capital investment for education.

In view of the limited funds available to the schools' department for investment and the difficulties in acquiring funds outside, various possibilities have been envisaged, including local government funding and control of investment, making regional services or bodies responsible for the material execution of works and even forming a semi-public school-building corporation to attract private investment (possibly this would be more profitable than the annual activities of the public trustee's office). Certainly measures of this kind deserve to be considered, for excessive centralisation eliminates any possibility of calling on local authorities to help (albeit they are more aware of their own requirements), neglects the opportunities that may arise, and is too slow and costly. There are also awkward problems to be overcome, such as expropriations and taking options on likely sites for schools in urban areas, incentives for the production - still quite recent - of text books, classroom and teaching aids (the creation of a national centre for the development of school syllabuses has been proposed for the purpose). Under this division of functions, the Ministry of Education would continue to be responsible for the planning, standardization and general supervision of investment.

The material condition of university buildings generally leaves much to be desired; only six universities have student hostels under construction; three others have organised architectural competitions for their building projects. Many universities occupy unsuitable premises, blocks of flats, obsolete buildings and conversions of new property. To cope with the increasing numbers of university entrants, scattered buildings are rented, a practice detrimental to community life. The shortage of accomodation is obvious and, in spite of the poor condition of the buildings (over one-third are in need of repairs or replacement), the thousand or so classrooms available in the Peruvian universities are used intensively and far above normal capacity, with lectures proceeding day and night. According to a nationwide survey, conducted in 1963 by the National Institute of Planning among university principals and deans of faculties, the investment required for university building is over Soles 2,000 million.

Resources for equipment are also extremely limited due to the high cost of material, usually imported, its rapid obsolescence and the need for constant renewal to keep pace with technical progress. Two universities have drawn up general development plans in which equipment needs have been foreseen and their financing arranged for at the same time as that of the building. The remainder have tried to finance part of their equipment out of their own resources, each looking round on the world market to see what is available in the absence of a university information service. The richer universities are therefore able to invest regularly in the equipment they need, but the poorer ones have not the necessary minimum facilities, and have to arrange to use those of other universities or enterprises in their area such as power stations, laboratories, regional hospitals, etc. The credits available for university libraries are usually very small; the universities suffer from a shortage of technical staff, and their investment budgets and regular current income are insufficient to finance the necessary expansion; accordingly the library services vitally needed by any higher educational centre cannot cope with the requirements of the students who have to make use of the public libraries. The publishing capacity of the universities is also very restricted, especially considering that the teaching staff is statutorily required to contribute to the country's bibliographical output. Because of these conditions, roneoed text books are produced by the teachers or the students themselves.

The largest investments made by private establishments are found in the Lima area, particularly in the new towns springing up around the capital, with the financial assistance of the students' parents. The shortcomings of the poorer schools are well known but cannot be estimated or legally controlled in the absence of any reference standard which could be insisted on or of adequate funds to meet the cost of educating the students, who, for the most part, were either refused admission or not allowed to continue in State schools.

2.2. Social aspects

The educational aspirations of the Peruvian population and the greater facilities provided have stimulated the expansion of education. Despite the lack of unity and efficiency in the educational system and the fall in teaching standards, the schools, through their influence on all sectors, certainly have a vital part to play in national integration and social mobility. One of the clearest signs of this is perhaps the difference now apparent between the educational standards of secondary pupils and their parents. This situation, which is the sign of a crucial transition period, may put an end to the principle of paternal authority in the family - already seriously undermined in Peru.

The use of Spanish among the aboriginal language-speaking population has considerably increased with educational expansion and closer economic integration (road building, use of coinage, marketing). Large-scale projects and plans have given rise to new jobs, higher incomes and purchasing power, and at the same time have caused seasonal movements of large groups of the population, attracted by the employment possibilities in coastal areas at periods of the year when farmwork is slack.

However, there are still many social prejudices which exert a negative influence on the demand for educational services. Easier access to the schools has led to the conviction that the facilities offered necessarily lead on to a university degree. This is contradicted by the facts, for only one student out of 20 actually realises this ambition. Another prejudice to be allowed for is the widespread preference among parents for arts courses, accompanied by indifference to scientific subjects and even scorn for technical careers. Such attitudes are encouraged by the present structure of secondary education and can be corrected only by an improvement in the conditions in science and technical education, by the creation of worthwhile jobs, and by a higher standard of living for science graduates.

Local authorities or elected representatives try to have their own secondary and higher education establishments when new ones are being set up; where these already exist, the authorities try to raise their status for reasons of social prestige regardless of what this will entail in the way of more highly qualified staff, the organisation of curricula, and the capacity and quality of premises and equipment. In general secondary schools there is strong social pressure to separate the sexes in co-educational schools although there is no official policy on this subject.

Through their trade unions the teachers have already made substantial progress with their claims, but there is still a long way to go, particularly as the teachers' union is the most powerful of all the middle-class unions and is expected to make an important contribution towards the technical improvement of education.

As a result of the social aspirations mentioned above and the small amount of technical efficiency shown by the school authorities, as might be expected, education in Peru has become the battle ground of opposing political factions which seek to define new targets and influence school activities. Such action has often degenerated into serious conflicts which are very inconvenient if education is to become a really national undertaking.

The University is beginning to assume the characteristics of mass education; students are drawn from a wider range of social and economic backgrounds, so that the university continues to lose its exclusive character. Nevertheless, although this education is free, many young people now entering the university have to work as they study in order to pay their way. A consequence of this is the frequent formation of study circles and evening tutorials at the universities.

It should again be stressed that the determination shown by young people to enter the university is strengthened by the belief that this is the only way open to them to satisfy their individual ambitions, and that the university is bound to open its doors to them. This erroneous idea has a good deal to do with the current orientation of secondary education.

Another phenomenon which has had considerable influence on the recent expansion of university education is the heavy social pressure brought to bear by local authorities or their representatives for the foundation of new establishments of higher education. New universities have sprung up at an extravagant rate and some of them have begun to function under conditions which are too precarious for them to contribute to the development of the communities they purport to serve.

These circumstances have strengthened the need to provide student welfare facilities in line with the university's financial and structural capacity but so far only three universities, in the capital, have adequate welfare schemes.

Since their origin, the Peruvian universities have played a prominent part in guiding and promoting the activities of the nation. At the foundation of the Republic, serious institutional crises and the breakdown of democratic order led the universities, with their traditional independence, to defend fundamental freedom and the ideals of national reform. More recently, increasingly violent partisan struggles have taken place inside the universities to the detriment of their true vocation. It is somewhat of a paradox today, when the country has entered a decisive stage in the restoration of institutional order, civic maturity and planned development, that small but very active minorities acting against the will of most of the teachers and students should spend their time creating difficulties for the university, undermining its prestige in the eyes of the nation, preventing it from carrying out its normal functions, and depriving it of any possibility of becoming the effective centre of education and culture in the region it serves.

2.3. Institutional aspects

2.3.1. Legal bases

Peru's educational system has its roots in the constitution and in two basic Acts, the 1941 Public Education Act, No. 9359 and the 1960 University Status Act, No. 13471. These two basic Acts are accompanied by four others of great importance for the development of national education, the Acts on: the Functional Budget of the Republic, Free Education, the Teachers' Status and Careers, and the Decentralisation of School Administration. The numerous provisions of these basic enactments make it essential that they be integrated to give a unified directive to educational activity.

The existence of two separate enabling acts, one for education under the Ministry of Education and one for the University, has impeded the co-ordination which would have avoided the present divorce between the syllabuses of schools and universities. This has accentuated the lack of unity in the Peruvian educational system and has prevented it from finding a suitable philosophy.

The 1941 Education Act, which has been in force for a quarter of a century, is not yet effective on several points (e.g. the National Educational Council has never functioned). Some of its measures have already been rendered obsolete by educational progress or by the Peruvian educational system's own achievements, whereas others have been invalidated by special legislation, more especially the annual Finance Acts which constantly upset the structure of the school's administration without bothering to amend the enabling act.

The circumstances mentioned in the preceding paragraphs have caused a disorderly outcrop of legal and administrative provisions - supreme decrees, supreme resolutions, ministerial and departmental resolutions, and without any legal coherence or administrative co-ordination and, far from contributing towards a better orientation of State education, have disorganised and paralysed its administration.

This situation has seriously curbed the powers of the schools' department to intervene; other public bodies, independent of the Ministry of Education, have taken upon themselves to produce school syllabuses which are utterly uncoordinated. At the same time, out-of-school activities have multiplied without any attempt being made to co-ordinate them. The retention of the two basic acts governing education has the support of the inter-university council, which deems it essential that the University Act should remain separate, while at the same time recognising the need for intensifying and systematising all efforts to bridge the existing gap between university courses and the syllabus of State schools. A Committee has been appointed by both Houses of Parliament to examine the state of public education in all its aspects, and at all levels, and to prepare the draft bill for a thorough-going Education Act now tabled in the lower House.

The Peruvian universities are granted legal autonomy in respect of teaching, and administrative and financial matters, and have their own system of management with the combined participation of teachers, students and graduates. However these excellent principles are not yet applied in practice and have already been breached in three ways: the financing independance of the State universities is constantly being violated by the annual Finance Acts and its amendments; politics increasingly intrude on university life, and outside factors are taken into consideration in the shaping and making of decision; the role played by Convocation in university administration is very small.

Gaps in the existing statutory provisions have allowed numerous universities, both state and private, to be set up during the past five years without any organisational co-ordination. The same is true of their colleges, of certain faculties (which are sometimes established in different towns from that of the mother university), different classifications and appellations of disciplines, specialities and degrees. Some attempt has been made to remedy these lacunae by inter-faculty agreements and the adoption of stricter conditions founding private universities. The inter-university council has drawn the attention of Parliament to certain limitations in the University Status Act, and is demanding fuller powers for the inter-faculty board, including that of deciding whether university projects should be undertaken and of planning the future development of Peru's universities.

Private educational establishments are usually organised in the form of profit-making undertakings exempt from taxation or financial control by the State, except as regards pension schemes, inspection of final examinations, the granting of official certificates of studies, and the supervision of school organisation. On the other hand, the constitutional provisions by which agricultural, mining and industrial undertakings are required to maintain free schools for the children of their employees receive only very limited application, and in the past ten years such schools received less than 5 per cent of the children attending primary schools. This is due to the shortcomings of the Act and its implementing regulations, which appear to be designed to safeguard the employers' economic interests rather than those of the children concerned.

The Education Act is based on the declared intention of allowing representatives of all the different economic and social sectors of the nation to share in the management of education through the National Council of Education. This intention deserves more attention in view of the circumstances in which the country has lately set about its development planning. Thus the combined efforts of the public authorities, of the forces of production, the parent/teacher associations, the churches and other representative bodies of the community at large will make education a genuinely national undertaking for the benefit of the generations still to come.

2.3.2. Administrative organisation

By the nature of its aims the considerable volume and widespread distribution of the population served, the large number of persons employed and the resources used, and the magnitude of capital outlay and the consequent financial cost of upkeep, Peru's educational system undoubtedly represents the biggest and most complex undertaking in the country; its administration nonetheless leaves much to be desired.

The abyss between the administration of the universities (autonomous) and of primary, secondary and non-university post-secondary education, plus the ineffectiveness of the National Council for Education, makes it impossible for the orientation and integration of the education system to be ensured.

At the Ministry of Education, administrative methods are archaic, overcentralised and bureaucratic. The technical management of education has been postponed under the growing pressure of over-centralised, administrative routine which takes up most of the time of the educationalists and administrators. Officials are appointed without any examination and usually have no specialised training: until 1960, their salary scale was inferior to that of teachers, so that recruitment was restricted to ex-teachers on full or partial pension. No continuity was possible, therefore, in the attempts to reorganise and modernise school administration. Even the structure of the Ministry, as defined by the Education Act of 1941, is constantly being upset, particularly during the annual vote on the Finance Act. Frequent changes of Ministers due to political vicissitudes have aggravated still further the lack of continuity in the orientation and administration of education.

To mitigate some of these defects, as from 1963 the government began gradually to decentralise school administration; in practice, however, this has not been done as planned, or according to the regulations. The objective is to delegate to new regional boards the duties and responsibilities hitherto over-centralised at the Ministry of Education. The growing expansion of the educational services in such a wide and varied country as Peru made a more dynamic regional administration absolutely necessary, the Ministry of Education being responsible for top level management and the technical and general administration of the development of national education. However, this decentralisation does not correspond to the socio-economic regionalisation of the National Planning Department, and nothing has been done to bring these two into line. There have been successive changes accompanied by the unwieldy growth of the greater Lima area, and the creation of new regional education departments some of which cover only a single local government. Use has not been made even of existing territorial boundaries, so that disparities are found in the regional indices for educational development.

The first regional education department began to operate in 1963 under very shaky material conditions and with a limited staff - detached from the Ministry of Education - having no special preparation and guided only by a set of regulations for regional departments and which, incidentally, are only partially applied. Since then the central administration has not succeeded in adapting its structure or the size of its staff to the changes called for by decentralisation; it now has a surplus of auxiliary personnel, giving rise to the costly duplication of jobs and frequent problems of competence, which in turn hold up the transfer of administrative powers from the Ministry to the regional departments. The move towards decentralisation, which is supported by all the political groups in the country, is hampered by interests which have nothing to do with education.

Educational planning has been influenced chiefly by the policy of expanding enrolment and by the government's investment programmes, other than those concerned with the proposed administrative reforms. Most of the permanent technical functions devolving upon the government have therefore frequently been delegated to extremely numerous but usually ill-coordinated and inefficient committees; thus the technical responsibilities for education have been watered down, whereas the administrative structure and resources should have been reorientated for more efficient management.

In the universities the administrative framework has mostly retained its traditional character: administrative functions (seldom assigned to the teaching staff) consist in carrying out the decisions of a collegial form of management. Responsibility is at two co-ordinated levels: central, and for each faculty; that at the centre comprises three basic organs; the general secretariat, the general administration and the general accountancy department. Only the specialised technological universities have introduced innovations, largely because they already apply full-scale development plans and have external aid at their disposal.

A factor which has had considerable influence in the past has been the unfortunate practice of confiding the organisation and getting under way of new universities to organising commissions appointed by the Government through the Ministry of Education. The inter-university council has been playing a more active part in recent years in certain projects for the organisation and reorganisation of the university, but its powers - certainly necessary - have not been officially confirmed. Attempts to streamline the administrative organisation are now being made at individual university level by means of planning offices, and at inter-university level by means of the National Inter-University Planning Office (OLIP), both of which are carrying out planning and research to rationalise administration. At national level technical advice is given by ONRAP (National Office for Rationalisation and Organisation of Public Administration).

The universities' relationships are growing more and more complicated as a result of the new planning and budgetary implementation techniques and the expansion of national planning. University development also means closer links with other graduate training programmes, with bodies dealing with technical and financial cooperation and with government schemes in general in all economic and social sectors. This trend throws into even greater relief the need to provide the universities with an official administrative machinery to enable them to play their due part in the country's educational development.

2.3.3. Organization of school work

Development at primary level has been hindered in particular by the fact that half of the teachers have had no teacher training whatsoever; the consequent fall in the quality of the teaching has proved an obstacle to the efficient use of the curricula and the carrying out of technical instructions, and has retarded the improvements to be made in the organizing of school work. If the limited resources of the schools and the lack of inspectors are also taken into account the considerable shortcomings in the orientation and methods of teaching are easily understood, the school resources being rarely comparable to those of the experimental conditions under which the present plan and curricula were tried out in 1953-54.

In addition, the technical direction has not paid sufficient attention to the need for a thorough knowledge of education and in particular to the many complex problems which occur at primary level such as: transition classes in towns where the mother tongue is aboriginal; the regrouping of very small schools; school redistribution or introduction of school bus services; the organization of school work in one-teacher schools; abolishment of the shift system in schools; a revision of the system of marking apprentices so as to avoid their falling behind, a reduction in drop-outs, failures, repeating classes etc. The conditions in primary schools are such that they cannot bring any light to the communities they are intended to serve, whether in urban areas, where the institutional framework is more complex and developed, or in country areas where a really rural school would have better possibilities of becoming a development centre for the community.

In planning his school work, each teacher has to draw up an analytical plan of the work for his class, a job which requires a considerable portion of his time. Apart from a few hardy experiments in the rural centres, the system of teacher training is neither extensive nor systematic enough for there to be regular refresher courses - particularly to improve the introduction of science courses into primary schools or to supply teachers with up to date teaching materials.

The few existing establishments for special education are out of all proportion to the large number of citizens who require some special form of education to enable them to take an effective part in the social life of the country. Very little has been done to find out which of the pupils attending primary schools should receive a special education.

The transition is very abrupt when the pupil changes from the one-teacher primary system to the multi-section secondary school and has to make an immediate choice without suitable guidance. Curricula are rigidly laid down for each subject, and consist of a number of very intensive courses, each under a separate professor, who is usually part time, and who will be the sole judge of the pupil's work in that subject. The new student, who generally lacks time and material both in school and at home, is rarely able to obtain the individual advice which would guide him through the crucial period of adolescence.

The number of secondary schools is growing very rapidly in the big cities. Their administration becomes heavier to the extent that this growth gives rise to greater staff hierarchy, making individual contact with the student increasingly difficult and often giving rise to disciplinary conflicts in the colleges.

The length of the university day and of term is being continuously reduced, the number of subjects is excessive and they are far too encyclopaedic, so that the student acquires bad habits in both his studies and general behaviour. Education is mainly oral and, as there is a very stupid prohibition of home work, the student tends to learn every thing by heart from text books and copies, being content simply to get through the examinations and tests set by his many teachers. He has no real enthusiasm for study, reflection, creation, esthetic taste, critical reading, mastering the means of expression, or for developing his own moral and physical well-being. His free time is being wasted in an attempt to face up to a complex and changing world without adequate training, explanation or guidance, and which offers him more lively and spectacular emotions than he can get in college.

The ties with home are very fragile and should be strengthened by means of adult education, for most parents have had only primary education - hence an unbalanced situation is created which threatens the traditional authority of parents.

The experiment of a second vocational cycle in general secondary education did not produce satisfactory results, since the students lacked guidance, both material and human supplies were scarce in the colleges, and the experiment was out of step with the reforms introduced at the higher education level.

In technical secondary education the shortcomings of vocational guidance are primarily due to lack of the necessary relations between institutes and firms. These relations could be mutually beneficial as it would obviously be to the benefit of the enterprise if education were to train, in sufficient numbers and of good quality, the staff they need to expand production. Education would also benefit since it can never equip its workshops to equal those in industry for students to acquire practical experience, or replace its equipment to keep pace with technological advance. Therefore, if technical training is to be efficient it must be based on coordination and the sharing of tasks and responsibilities between education and industry, although at present the gap is very wide. Many young people who entered technical secondary school below the regular age, would like there to be equivalence with general secondary education, to which they would like to be transfered in the hope this would open up for them a more direct road to the university.

Intermediate education has developed only recently at a very rapid rate, but without any coordination, and with all the risks this entails for the subsequent orientation of this important sector of education. As it is at this level that junior executives and technicians are trained for the country's productive activities, the pressure on universities from secondary education graduates will thus be eased.

The variety of administrative departments on which depend the teacher training establishments, and the many specialities and curricula prevent the providing of a basic training which should be common to all future teachers in Peru. This situation became even more complicated when authorization was obtained for the creation of a number of private teacher-training schools which add but little to the previsions and hopes of the State. Even though curricula were rejuvenated by the creation of four distinct sections, the subsequent frequent changes made to them did not allow a suitable equilibrium to be maintained in the professional training of teachers. For teachers in primary school, for example, it is not known whether they should teach the whole curricula unaided, or whether they are to have an assistant.

The length of the training course differs in the various centres, although according to the Act concerning service conditions for teachers it should be uniform.

The traditional boarding schools made an effort to improve productivity but no analysis has been made of the results, and there has been a considerable increase in the non-boarding type of training school, particularly in the private sector.

As a result of the precariousness of their conditions, the teacher-training centres are able to make only a very small contribution to educational research, whether in the form of analyses of the present situation or of recent improvements in teaching methods.

The traditional system whereby the university is divided into Faculties, Schools and Institutes was duly considered by the Act on the University Statute but, in the opinion of the Inter-University Council, makes any effort at modernization more difficult. It often strengthens the already excessive autonomy of each Faculty within the University, whereas a system of departments would make possible greater flexibility in the curricula - which are at present too rigid - and the better use of the University's technical and material resources - where some obvious duplication now exists - and so provide students with full training, in line with their aptitudes.

Some universities are at present experimenting with different forms of organization, within the framework of their statutes and regulations, including general courses, university semesters, "credits", extension and post-graduate courses, etc. There are many other projects for improving curricula, most of which remain unknown however, since lack of coordination between the universities prevents any exchange of experience being made which might be useful at university, national and international levels for improving the use made of human and material resources. Much still remains to be done, especially in the newly-created universities where there is a shortage of material resources and where either staff have had to be improvised or very advantageous terms offered to attract personnel from other universities. The university has not been able to extend its influence to all the communities in the region it serves and, as a result of the limitations mentioned above, is forced to restrict its actions to the benefit of its students only.

The Inter-University Council has requested that a wider definition of the duties of university professors - to include not only teaching but also research and other work - be made in the Univ rsity Statutes.

The amount of research work conducted by the professors of the Peruvian University is known to be very limited, and lack of funds is generally given as the reason for this, although the Government (especially in recent years for the preparation and execution of development projects and programmes) has paid out considerable sums to consultants, technicians and specialists (many of them associated with foreign universities). Various studies and supervisory work have been carried out without any increase in the research capacity of the Peruvian University which ought very soon to be playing an important part in this fiels. The Government's policy should be defined, for at present much of the research potential is imported (one of the conditions of foreign aid), whilst inside the country research work is being entrusted either to government technical personnel or to autonomous research institutes set up outside the University, whithout any organ being created on a national scale, to co-ordinate or promote research in Peru.

2.4. Financial aspects

2.4.1. Internal financial effort

The internal financial effort made in education in Peru is considerable and is one of the most important in Latin America. Table N° 2-14 and Diagram N° 2-23 show that total expenditure on education rose from 3.1 % of gross domestic product in 1960 to 5.1 % in 1965. When the new salary scales for teachers are fully applied, expenditure is expected to rise to 7 % of the gross domestic product.

The public sector figures for 1960-1963 are the actual figures and correspond to those in the annual budgets, while for 1964 and 1965 the figures were calculated on the basis of approved budgets. As a result of the increase in public expenditure as from 1963, expenditure on public education fell, in relative terms, from 21.1 % in 1962 to 19.8 % in 1964, rising in 1965 to 20.6 %, as a result of pay increases for teachers. For capital expenditure, the maximum percentage was reached in 1961 with 6.2 % of public capital expenditure going to education, to fall to 3 % (less than half) during 1962 and 1963, and then rising progressively during 1964 and 1965 as a result of the "Programme of Public Investments".

No information is available concerning expenditure on private education; net expenditure was therefore estimated on the assumption that average costs would be equivalent to those in the public sector.

The considerable expenditure on public education was financed almost entirely by the Treasury of the Republic, private resources having practically disappeared since 1964, when the Free Education Act became operative for all levels of education. The revenue from the so-called Special Acts attained only from 3 % to 5 % of total expenditure. Only two universities, so far, have obtained external credits for financing large-scale projects. The Ministry of Education depends exclusively on internal financement, except for a few cases of external help received in connection with technical assistance,

Table 2-14

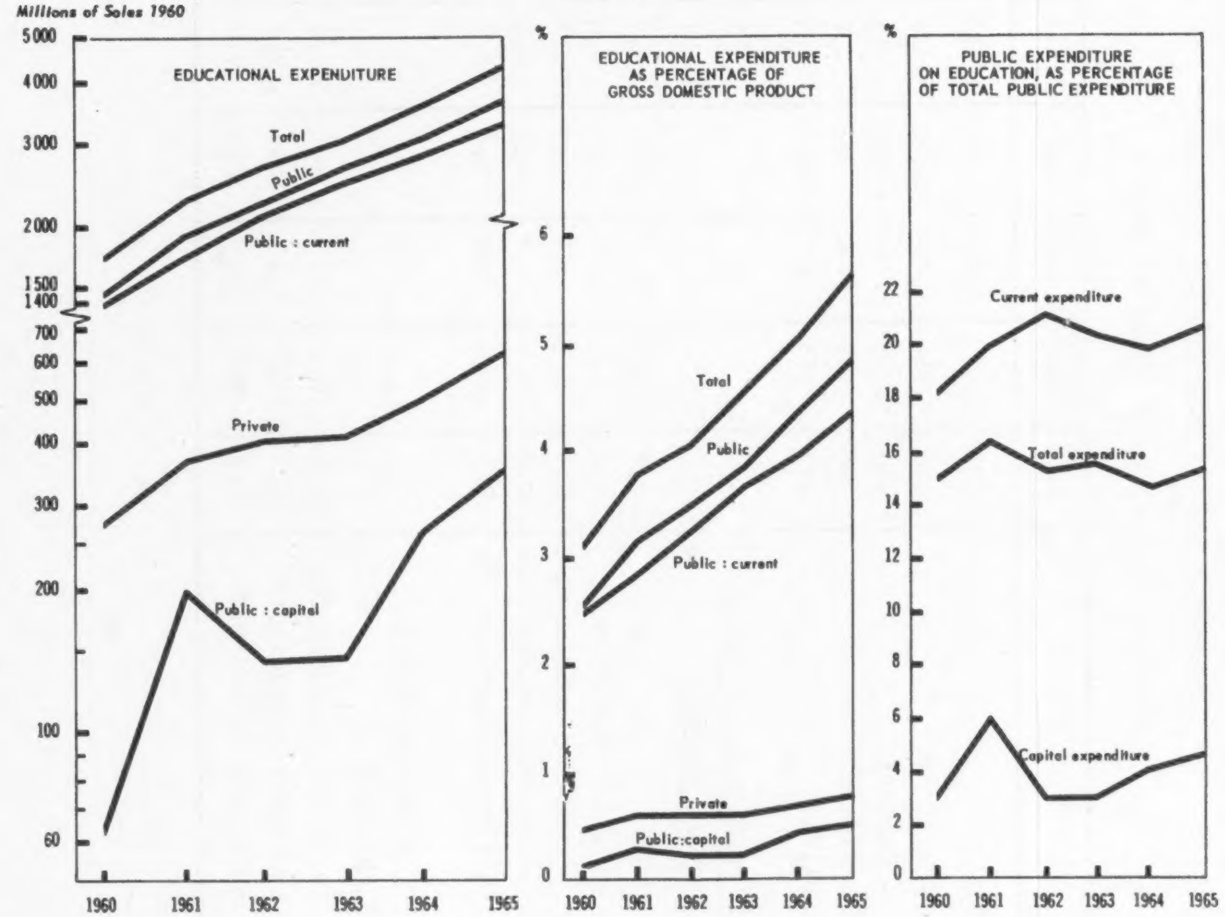
TREND OF TOTAL EXPENDITURE, CURRENT AND CAPITAL, PUBLIC AND PRIVATE, ON EDUCATION IN RELATION TO GROSS DOMESTIC PRODUCT AND TOTAL PUBLIC EXPENDITURE, 1960-1965

(Absolute figures in millions of 1960 Soles)

	1960	1961	1962	1963	1964	1965
TOTAL	1.738	2.317	2.685	3.087	3.622	4.311
- PUBLIC	1.467	1.944	2.274	2.670	3.118	3.685
- Current	1.407	1.752	2.132	2.525	2.848	3.321
- Capital	60	192	142	145	270	364
- PRIVATE	271	373	411	417	504	626
AS PERCENTAGE OF GROSS NATIONAL PRODUCT						
- TOTAL	3,1	3,8	4,1	4,6	5,1	5,7
- Public education	2,6	3,2	3,5	3,9	4,4	4,9
- Current expenditure	2,5	2,9	3,3	3,7	4,0	4,4
- Capital expenditure	0,1	0,3	0,2	0,2	0,4	0,5
- Private education	0,5	0,6	0,6	0,6	0,7	0,8
AS PERCENTAGE OF PUBLIC EXPENDITURE						
- Total public education	15,0	16,4	15,3	15,5	14,7	15,3
- Current expenditure	18,1	20,0	21,1	20,4	19,8	20,6
- Capital expenditure	3,0	6,2	3,0	3,0	4,0	4,6

Diagram 2-23

TREND OF EDUCATIONAL EXPENDITURE AS A PERCENTAGE OF GROSS DOMESTIC PRODUCT AND OF PUBLIC EXPENDITURE, 1960-1965



bi-lateral, or multi-lateral agreements. During the past three years, the contribution made by local communities has increased considerably in the form of donations of plots of land, local materials and even labour man-hours. These activities are encouraged in the more remote regions by the State in the form of technical supervision and offers of material and financial help. As a result, 4,500 primary classrooms, mostly in rural zones, have been built or transformed.

Income in the private sector is regulated only indirectly by the State, and even then only in the form of approval of pensions, or of students' fees. Private educational establishments are for the most part profit-making enterprises exonerated from all duties and taxes. This exceptional situation is defended on the grounds that the contribution made by the private sector is necessary and desirable, but it nevertheless prevents the State from acquiring the information necessary to decide on the rights of the teachers or on the financial responsibilities of the parents. Neither have any estimates been made as to the amount of the contribution due from employers in respect of their legal obligations towards educating the families of their workers. No report has been made with a view to changing this contribution which, in practice, has proved difficult to apply and control when the Executive has tried to introduce legal reforms to ensure the application of the law. The same applies to Article N° 149 of the Organic law on Education which stipulated that the equivalent of 7 % of the enrolment in private primary schools should be free.

It is possible to analyse public expenditure on education as from 1963 thanks to the Table of Expenditure, laid down by the Organic Law on the Functional Budget. Table N° 2-15 and Diagram N° 2-24 show the trend of public expenditure on education from 1963 to 1965.

In general, for public education, current expenditure continues to represent a considerable proportion of total expenses (90 % in 1965). As shown above, this confirms that investments are sacrificed as a result of the shortage of General Treasury Funds. During the past ten years, however, current expenditure has always been superior to budgetary estimates, the deficits being subsequently covered by payments considerably above those which annual investment would have required. In practice, therefore, the sacrifice of investment, in an attempt at an impossible balance of the budget, has proved useless.

Diagram 2-24

BREAKDOWN OF PUBLIC EXPENDITURE ON EDUCATION, BY END USE 1963, 1964 AND 1965

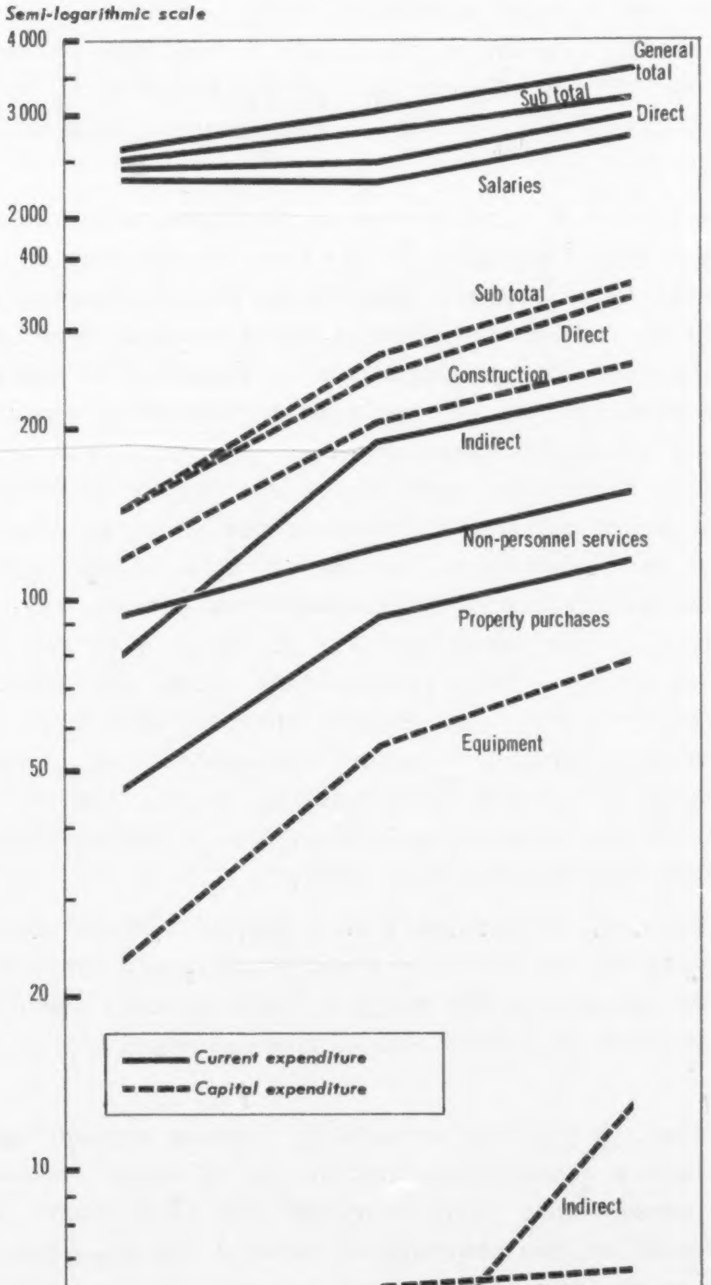


Table 2-15

BREAKDOWN OF PUBLIC EXPENDITURE ON EDUCATION, BY END USE
1963, 1964 AND 1965

(Actual figures in millions of 1960 Soles)

	1963		1964		1965	
	Actual figures	%	Actual figures	%	Acutal figures	%
TOTAL	2670.0	100.0	3118.0	100.0	3685.0	100.0
Current expenditure	2525.0	94.6	2848.0	91.3	3321.0	90.1
- Direct	2440.0	91.4	2551.5	81.8	3083.5	83.7
- Salaries	2297.3	86.0	2332.6	74.8	2806.4	76.2
- Properties	47.6	1.8	94.1	3.0	121.2	3.3
- Services	95.1	3.6	124.7	4.0	155.9	4.2
- Indirect	85.0	3.2	296.5	9.5	237.5	6.4
Capital expenditure	145.0	5.4	270.0	8.7	364.0	9.9
- Direct	145.0	5.4	266.1	8.5	351.0	9.5
- Construction	121.5	4.5	204.3	6.5	263.3	7.1
- Equipment	23.5	0.9	55.6	1.8	81.1	2.2
- Buildings	-	-	6.2	0.2	6.6	0.2
- Indirect	-	-	3.9	0.1	13.0	0.4

The high proportion of current expenditure allocated to remuneration for personnel services should be noted. This is usually an indication that the quality of education is only mediocre due to the lack of funds for materials and non-personnel services, both important elements in modern education.

The traditional weakness of investment in education - contrasting with the substantial increases in other social sectors such as housing and public health - has resulted in a serious deterioration in the quality of educational buildings. The additions to rearrangement of school capacity are not keeping pace with the expansion in enrolment, and funds are insufficient for the maintenance of buildings and school equipment; because of this it is now necessary to improve or rent school premises.

Less than 50 % of the investments in 1964 and 1965 included in the "Public Investments Programme for 1964 and 1965" were covered by the Annual Budget Act.

To resume, the financial effort made for State education has been considerable, but the nature of the financial resources and methods of allocation, the financial structure of expenditure, inefficiency and low productivity - which will be analysed later in detail - prevent education from making a more effective contribution to national development. In short, for the medium term, efforts should be concentrated not so much on increasing financial resources - which already consume a relatively large share of what is necessarily a limited gross domestic product - but on making more effective use of the resources already available to cope with the rapid expansion.

2.4.2. Budgetary planning

In the public sector there now exists a valuable instrument, in the form of the Organic Law on the Functional Budget, for planning educational expenditure. Since 1963, all the obsolete budgetary techniques are being systematically revised. The educational system, however, has not taken advantage of these modern methods to rationalize its financial administration and facilitate the planning of educational expansion by extending participation in budgetary planning to all the executive services, and by standardizing educational services where this would help reduce costs.

There has been some improvement since 1963 in the State's Annual Budgets; the public sector has been paying more attention to systematizing the credits for the programmes and to improving the classification of expenditure; a similar classification has also been adopted recently for the revenue side. Certain parts of the Organic Law on the Functional Budget, however, have not been applied, including that requiring a breakdown of each programme included in the budget. Considerable delay has thus occurred in drawing up the estimates for the budget projects, and these would provide fuller details of expenditure and action taken. This also means coordination difficulties between the executive and legislative authorities when the Annual Budget is presented for approval.

For the Ministry of Education, the decentralization begun in 1963 has led to the adoption of clearly decentralised budgetary programmes. Education has been divided into two headings, one corresponding to National Administration (central), and the other to Regional Administration. Under the latter each Educational Region submits a programme showing the financial authority concerned, and a programme for each level and branch of education: primary, secondary, technical, teacher training, physical training, cultural and special education.

Nevertheless, centralisation is still strong in both budgetary programming and the allocation and distribution of funds. This situation is due primarily to the tradition of centralization which is still deeply rooted in the educational system, and is strengthened by the centralization of the general political and administrative organization of the country. Secondly, there is not enough specialized personnel or adequate material to provide the Regional Directorates of Education and the heads of the financial services responsible for school credits - about 1000 - with the necessary means effectively to participate in the procedure for planning the budget. Finally, the specialized personnel and material resources available are not sufficient to coordinate and control this procedure at national level.

Only the central administration is competent to make budgetary payments in respect of school buildings, to transfer credits to other government departments, to pay non-active staff and family allowances, and to make financial settlements. Similar procedures are now being applied to general budgets when supplementary pay is granted to staff. The central administration's budget for 1966 consisted of Soles 907.6 million - in 1965 it was 400 million - for the payment of basic salaries and fringe benefits to active and non-active personnel, in accordance with the new pay scales. The staff budgets also show the old scale rates, even though no longer valid, and a chapter for overall expenditure which is difficult to control, but which is clearly below requirements. It is estimated that, as a result of the 25 % pay increase in 1955 and the 50 % increase in 1966, for the first ten months during which the new rates were applied in 1965, expenditure rose to approximately soles 700 million, and, for 1966, will be more than soles 1,500 million. These figures are far above the budgetary estimates whose actual figures are known only after a considerable delay. In spite of the fact that staff salaries represent more than three quarters of the total expenditure on State education, little is known about the staff structure, and, if large increases are granted under a very complicated scheme, it is very difficult to make budgetary provisions for them. The absence of a coding system for registering and controlling permanent teaching posts has resulted in a considerable amount of duplication and the haphazard creation of posts outside official budgetary plans.

We have already shown that the old complicated system of overall allocations to education - without any previous approval of the budget - has been replaced by a system which is just as extreme: from now on, the educational section of the budget will include a long list of small works for which an excessively detailed breakdown is made. They thus escape the limited means of control available to the central authorities, and investments are made outside the budgetary estimates, thus upsetting the work done by the planning services. Similarly, the Education budget - and the administration - is overloaded with a confused mass of transfers to a wide variety of private beneficiaires, without any account being taken of the contribution they make to education. These transfers, which grow from year to year, are no more than a reflexion of a traditional but mistaken idea of the role the State should play in the search for the common good.

The excessive centralisation and lack of uniformity in the method of showing expenditure causes congestion in the budgetary administration and renders control very inefficient. Added to this are the numerous changes apparently necessary when putting into operation nearly one thousand detailed budgets, and the continuous and inopportune creation of new services which have to be included in the programmes and financed at short-term in order for them to be included in the budget. The work involved takes up most of the time of the educational administrative staff, preventing them from spending more time on financial studies or the work of planning which, under the Organic Law of the Functional Budget, should be carried out according to a certain time table. This would, nevertheless, have been a good method of making the provisional educational budget into a technically well conceived and prepared tool, one which would be less vulnerable to outside interests and interferences, and whose priorities and aims would be defined and justified by the competent authorities in educational policy.

At university level, where the lack of financial resources is notorious, the financial position varies considerably between State universities, and there is also some difference as between faculties within the different universities. On the other hand, the financial situation in private universities is generally very satisfactory, since they are legally required to have considerable funds and are free to fix their own fees.

The National universities depend for about three-quarters of their expenditure on credit transfers from the Treasury and various receipts under the Special Acts. This heavy dependence on the Government often results in an inequitable distribution of funds as between universities; the autonomy of a university may also be adversely affected when the funds allocated under the Functional Budget of the Republic are reserved for a specific purpose without the prerogatives of the university authorities being considered. Each year this gives rise to greater uncertainty and worry, for the limited resources mean that the increasing demands of the universities cannot be met and that appeal must be made to the Legislative Chambers.

The national universities' own resources meet barely 4 % of their total expenditure. The Free Education Act alone has meant a loss of at least soles 70 million in their income. It is now thought that those students whose parents have a high income could easily make a greater contribution towards the development of the university, without this barring their access to the university or infringing the principle of free education. In addition, the universities do not get as much financial benefit as they might from the goods and services they produce, possible financial contributions from their graduates, or help from employers, or other private, community or regional organisations.

Since there is no proper coordination of budgetary plans at interuniversity level, each university has remained free to draw up it's own yearly budget. The Ministry of Education who, for reasons of service, is responsible for making most of the transfers of funds going to the universities, traditionally limits his budgetary estimate to an overall amount for the different universities, subsequently making very small increases and submitting a detailed study of the problem to Parliament for consideration.

2.4.3. Unit costs

In spite of the importance every large-scale enterprise attaches to cost analysis, there is only a very small amount of information available concerning the costs of Peruvian education. Only public expenditure on education is known, and this can be broken down into sectors only as from 1963, that is, subsequent to the Organic Law on the Functional Budget.

Even for public expenditure on education it is difficult to evaluate the information available on investments or to analyse the cost of the capacity available, whether for new facilities or to improve existing school services, in relation to the population benefiting from these investments. The exact rate of depreciation must be known if an estimate is to be made of the investment required to make the necessary replacements and improvements and, in general, for the maintenance of all school equipment. These difficulties must be overcome, for equipment and construction delays - which are considerable - are affecting the quality of education. Financially speaking, the situation may also be criticised, for example during the past five years construction costs have increased at an annual rate of approximately 10 %.

The level of current expenditure per pupil in general education (primary and secondary) is very low and has been falling during the past three years. Nursery, primary and secondary schools account for two-thirds of total current expenditure on education, so that a substantial increase in unit costs - very necessary to improve the present standard of these schools - would entail a very large increase in the already considerable proportion of gross domestic product going to education. This situation once more brings out the importance of increasing the number of those who pass the primary and secondary school-leaving examinations, for, in view of the greater medium-term demand expected as a result of the present rapid increase in population, it does not appear possible to finance such

Diagram 2-25

AVERAGE DIRECT CURRENT EXPENDITURE PER STUDENT, BY LEVEL AND TYPES OF EDUCATION, 1963, 1964 AND 1965

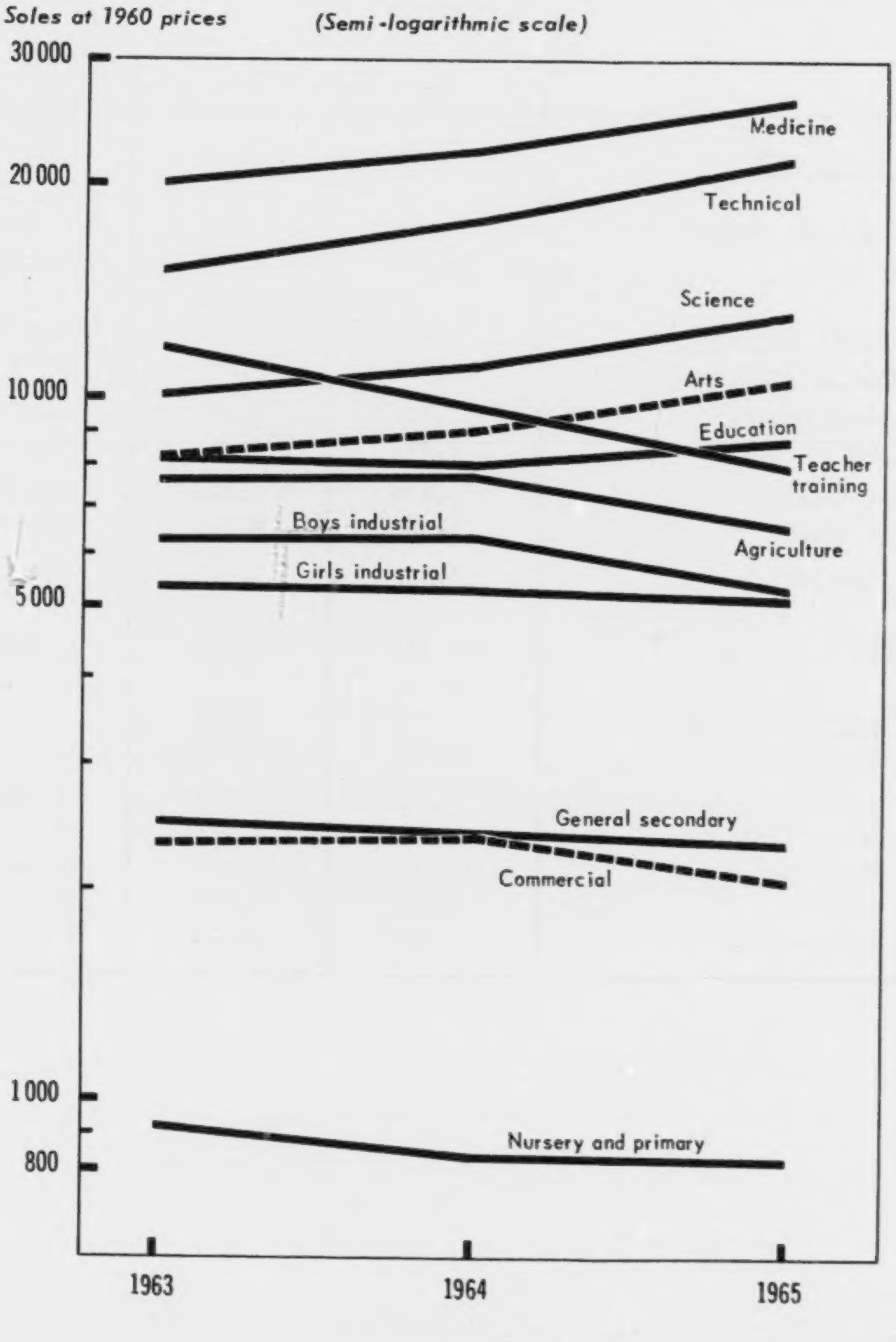


Table 2-16

CURRENT EXPENDITURE PER PUPIL IN STATE EDUCATION, BY LEVEL AND BRANCH OF EDUCATION 1963, 1964 AND 1965

(1960 Soles)

	1963	1964	1965
ALL BRANCHES	1,439	1,389	1,425
NURSERY AND PRIMARY	924	829	825
SECONDARY	2,971	2,880	2,684
- General Secondary	2,485	2,387	2,303
- General Technical	4,619	4,655	4,108
- Agricultural	7,632	7,703	6,605
- Industrial	5,833	5,895	5,302
- Male	6,339	6,346	5,370
- Female	5,363	5,345	5,192
- Commercial	2,358	2,382	2,087
HIGHER	10,846	11,386	12,640
- Teacher Training	11,851	9,679	7,924
- University	10,696	11,689	13,585
- Education	8,250	8,116	8,686
- Humanities	8,250	8,986	10,423
- Medicine	20,000	22,116	26,057
- Science	10,000	11,075	13,029
- Engineering	15,000	17,702	21,714

expansion under present conditions (an excessive proportion of "repeaters" with consequent longer schooling) and at the same time improve the quality of education - which would inevitably give rise to an increase in current expenditure per pupil.

Current expenditure per pupil in technical secondary education is also affected by the present freeze, even though it is practically double that of general secondary education. For the reasons given above, these average unit costs are not really high. This situation is largely due to the way in which the teachers are used, and to the favourable ratio of the number of students to teachers. This is confirmed by the fact that salaries account for a large proportion of current expenditure, at the expense of new equipment and other types of service (non-personnel); expenditure on the latter is negligible in comparison to the requirements of the vocational training syllabuses.

For teacher training there is also a fall in the average unit costs, but this is mostly due to the relatively small number of advanced teacher-training schools and boarding students, and to an increase in the load per teacher.

At university level, however, the average costs per student are increasing for all faculties. Those for Medicine and Engineering are acceptable, and are in line with the high level attained by these specialities. In Science, however, unit costs are extremely low and reflect the very mediocre quality of scientific education. For Education, costs are relatively low and remain practically stationary. For Humanities there is a rapid increase, but, in the near future, a more detailed analysis will have to be made giving a breakdown by the different disciplines concerned.

This study of average costs should be completed by an analysis of the marginal costs of the new services created each year; detailed information is lacking here, for it has not been the custom to make budget-type estimates according to the type of establishment or the size and stage of development, to calculate costs. Unit costs show a considerable disparity between establishments at the same level, and between the same branches of education. A brief study of almost all the (detailed) 1963 and 1964 budgets for educational establishments showed, for current expenditure by section, differences varying from 28.4 % for general secondary to 43 % for teacher training. Similarly, for current expenditure by student, differences were 33.8 % for agricultural departments, 38.9 % for industrial departments (boys) and 51.1 % (girls) and 44.0 % for commercial. It seems therefore, that the lack of standardized costs is mainly responsible for the present inefficiency in educational expenditure.

One study which must be undertaken in the field of educational research is an analysis of the more important components of educational expenditure, on the basis of their effect on future expansion, school curricula and probable cost trends. This is urgently needed for the progressive application of the new pay scales for teachers, and for the standardization of school building and equipment.

2.4.4. External financial aid

In general, foreign aid for educational development is conditional on the establishing of strategic investment projects and on part of the cost being met by the country concerned. If the amount of investment to be financed under these conditions were evaluated, a comparison with the total expenditure on education would show that foreign aid is likely to represent only a very small proportion.

In view of the long-term general benefit to be obtained, consideration has been given to the possibility of foreign loans being made on easy terms, i.e. at a low rate of interest and on long term conditions, with a period of grace for repayment, (recommendation approved by the Inter-American Economic and Social Council of the OAS at its Third Annual Meeting in 1963).

The financing of public expenditure on education in Peru relies almost entirely on the General Treasury Fund, for the Special Acts have been responsible for between only three and five per cent of the total income each year, whilst the establishments' own resources have been reduced to a minimum and foreign credit is very limited. In view of the conditions and the time required for negotiations for aid from organizations for international cooperation and the insufficient means at the disposal of the Peruvian administration for preparing projects, a small short-term domestic loan had to be negotiated to cover urgent investments as a result of the rapid increase in construction costs (10 % per year). The possibility of foreign loans from private organisations is now also being considered, as this would have the advantage of being more rapid.

Up to 1965, the Ministry of Education was unable to negotiate any loans with foreign aid organisations, since its technical projects were not sufficiently advanced to meet their requirements. On the other hand, the loans granted to the national universities that same year amounted to 20 % of the total expenditure on public university education, and were used mainly for investments in construction and equipment. Here again, this end-use requirement limits the possibilities of financial aid, for at university level direct current expenditure is high in comparison to investment (it is estimated, for example, that for each sol invested in construction or equipment, operation expenses will be slightly higher than one sol for each subsequent year).

These of the universities with general expansion projects or investment programmes have obtained credits from organizations for international cooperation: 6 million dollars from the Inter-American Development Bank (Social Progress Fiduciary Fund) and one million dollars from the Agency for International Development of the United States of America. These loans are repayable in 20 years, and bear interest at 1.25 per cent; they have one year of grace and a commission of 0.75 %.

Some universities are now obtaining domestic loans for small amounts, through the National Deposit and Consignment Bank, mainly to carry on with work in progress, and for emergency building. These loans are repayable from funds received under the Special Acts, and are not subject to approval each year, as are the funds coming from the Treasury. The time required to negotiate a loan and the rapid rise in costs - especially in construction - frequently mean that a loan from an international organization is not so advantageous as a local private loan which can be obtained so much more quickly.

Nevertheless, in spite of Peru's considerable domestic financial effort she has received only a very small amount of aid from abroad. At present, the universities are channelling their development projects and their requests for foreign loans through the National Inter-University Planning Office, while the Ministry of Education is negotiating with the World Bank for a loan to expand the Polytechnical Institutes and Regional Colleges.

2.5. Strategy for educational development

In its analysis of the strategy to be adopted for developing the various sectors of the Peruvian economy the Education and Human Resources Commission outlined in tabular form the country's educational situation as it stands in relation to the Economic and Social Development Plan for 1967-70. It endeavoured to "identify the basic difficulties standing in the way of the country's development" and express in quantitative form the relationships between these difficulties and Peru's general problems, economic and other. It hoped that this survey would help towards "defining the main features of an economic and social policy to resolve these problems".(1)

One column lists the general non-economic problems of the greatest consequence to the development of education in Peru and another the most serious economic problems, some of which are aggravated by difficulties specific to the Peruvian educational system. By superposing these two columns, which apply to all the sectors covered by the 1967-70 Plan, it is possible to see where the main bottlenecks occur in the country's economic and social affairs. The main problems to be solved by the Peruvian educational system itself lie in an intermediate zone.

According to this analysis, educational development came up against four major problems in the past, that is before the present planning process was begun. These were:

1. The absence of an overall educational policy;
2. The rapid but unplanned increase in educational facilities, largely due to direct action by the State;
3. The declining quality and low productivity of the educational system;
4. The important, though ineffective domestic financial effort.

The Commission also identified six subsidiary problems which were of considerable strategic importance in the past owing, among other things, to their direct effect on the major problems mentioned above. These were:

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(1) CIBS Nomino de los Nueve. "Notas sobre el proceso de la planificación en América Latina". CIBS/854, 7th March, 1966.

(a) Administrative shortcomings.
(b) Increasing, but unchannelled, social demand.
(c) Educational system ill-adapted to development needs.
(d) High proportion of unqualified teachers.
(e) Small capacity for the preparation of educational schemes.
(f) Insufficient progress in budget planning.

Among the general non-economic problems that have added to the difficulties peculiar to the educational system, the analysis attaches great importance to social questions, which do much to distort the trend of education. Given the rapid expansion of education over the past ten years and the financial effort made in this direction, reorientation of the system ought logically to enable it to contribute more effectively to the country's economic and social development.

As for the system's influence on the economy (right-hand column), it is evident that its indiscriminate expansion has prevented it from playing a useful part and that in future the order of priority given to education will depend on how much it contributes to the country's economic progress. In this connection it is interesting to note how the Education and Human Resources Commission(1) sees the part education might play in relation to the four overall objectives of the Economic and Social Development Plan for 1967 to 1970(2).

Overall objective No. 1: Reduced dependence on foreign countries

Contribution by the educational sector:

1. Raising the general standard of living, with a view to strengthening and expanding the domestic market.
2. Educating the consumer, with a view to turning local domestic resources to better account.
3. Training labour, with a view to developing domestic production as a substitute for imports.

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(1) "Educación: objetivos, estrategia y políticas básicas" (working paper) May 1966.

(2) Consejo Nacional de Desarrollo Económico y Social. "Definición Preliminar de Objetivos Generales para la Elaboración de un Plan General de Desarrollo Económico y Social". (Approved 29 th January, 1965).

4. Training labour, with a view to increasing, diversifying and improving export production.
5. Increasing the opportunities for education, with a view to reducing the outflow of students and the intake of foreign personnel.
6. Encouraging the schools themselves and domestic concerns to produce educational equipment and teaching aids in order to cut down imports.
7. Making better use of financial resources in order to reduce borrowing from abroad.

Overall objective No. 2: Redistribution of income

Contribution by the educational sector:

1. Equal educational opportunities for all, with a view to encouraging national integration and social mobility, eliminating illiteracy, generalizing primary education, and contributing to community development in the least favoured areas in order to help their integration into a modern money-based economy.
2. Training of the skilled manpower needed for the country's economy, with a view to improving the quality of the human resources available and offering them better occupational and financial prospects.
3. Higher pay for those employed in education, who in future will account for over 2 per cent of the active population; this is particularly important, as it concerns mainly the "upper middle class".

Overall objective No. 3: Increased domestic production

Contribution by the educational sector:

1. Better initiation of the public in general and students in particular in their role in the country's development, by arousing their interest in productive activities and removing the dangerous prejudices that exist at present.
2. Training workers of the right quality and in the quantities and at the time they are needed for productive activities.

Overall objective No. 4: Occupational development

Contribution by the educational sector:

1. Adjustment of training programmes and retraining of workers to meet foreseeable demand resulting from economic development, in order to reduce unemployment and underemployment, and make the best use of the country's manpower.

2. Vocational guidance for students and supervision of their subsequent careers.
3. Co-ordination of activities and sharing of work on the lines most likely to facilitate out-of-school training.

When the first Cabinet of the present constitutional Government took office, the President of the Council in August 1963 defined the broad lines of the Peruvian educational programme before the two houses as follows(1):

"What we are planning is a reform of the educational system which, while respecting every family's right to education, will fulfil the threefold aim of promoting full training for young people, giving equal educational opportunities to all and providing the country with the technical personnel it needs for its economic and social development".

He then went on to name the three main problems facing the educational system:

1. Weakness of the infrastructure, due to lack of resources and deterioration of the premises and educational equipment in use.
2. Educational and cultural isolation, from which a large section of the population had suffered in the past.
3. Need to improve the status of the teaching profession.

The following were some of the remedial measures proposed:

a. Supplementary foreign credit and action by the local authorities under a "people's co-operation" programme to resolve the infrastructure problem.
b. Affirming the principle of free education and getting employers to respect their obligations regarding the education of their employees' children.
c. Taking the necessary steps to hasten the process of integrating the rural population and illiterate persons into the life of the nation.
d. Improving the status of teachers by promulgating a Teachers' Statute, setting up a Teachers' Savings Bank, providing them

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(1) See also: Alianza Acción Popular - Demócrata Cristiana "Bases para el Plan de Gobierno". Lima, April 1963.

housing, placing them administratively under the responsibility of the Ministry of Education and raising their training to university level.

e. Assigning priority to vocational education, with specific regard to the number of skilled workers needed for the country's economic and social development.

f. Assistance for the development of the Peruvian University and for cultural activities throughout the country.

In the present state of Peruvian education, as described in Chapter 2, the following further measures are called for:

a. Formulating, approving, applying and regularly reviewing an overall educational policy capable of strengthening the structure and general trend of the educational system, by ensuring its coherence throughout its various branches and levels and by adapting it to the requirements of development.

b. Appreciably improving the quality and productivity of the educational system, by giving teachers improved curricula to work with and by making better material resources available for educational purposes.

c. Modernising the administration of public education at central, regional, local and individual establishment levels.

d. Stimulating the progress of education by associating it with the general planning of national development.

The Education and Human Resources Commission defined in preliminary form the following ten principles for formulating a long-term educational policy:

1. Equal educational and cultural opportunities for all.
2. Provision of training to enable each individual to make the most of himself according to humanist and Christian principles.
3. Harmonious development of the educational system and its diversification according to the principles, criteria and schemes prescribed by the economic and social plans, thus making the whole Peruvian population development-minded and enabling it to make a direct contribution to the work of planning.
4. Improvement of the institutional and school structure and of the technical management of the nation's educational system, freeing the latter from the harmful interference of outside factors and interests.

5. Decentralisation of administration and raising of its technical level.
6. Improved occupational, social and economic status for the teaching profession.
7. Establishment and maintenance of an infrastructure ensuring the most suitable conditions for the work of education.
8. Improvement in the output and economic efficiency of the educational system.
9. Encouragement of the private sector as a whole to cooperate and participate in the nation's educational effort under the conditions prescribed by the government in conformity with the national interest.
10. Participation by the nation in the benefit from, while at the same time contributing to, the increasing number of international co-operation schemes in the educational and cultural fields, provided that its sovereignty and prestige do not suffer thereby.

In addition, the Commission proposed that the following medium-term approach be adopted towards education within the context of the 1967-1970 Economic and Social Development Plan(1):

1. Reinstatement of the National Board of Education, a body responsible for determining the country's overall educational policy.
2. Strengthening of central and regional educational planning services.
3. Structural overhauling of the educational system, to bring it closer into line with the development of economic activities.
4. Updating of curricula and teaching aids, and intensive methods for the latter's use; improvement of the mark or grade system so as to increase the output of graduate students and enable a closer check to be kept on scholastic progress.
5. Strengthening the teaching force in such a way as to increase its stability and raise its professional status.
6. Improving the educational infrastructure by adopting standard types of building and equipment, thereby standardizing costs and turning

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(1) "Educación: Objetivos, Estrategia y Políticas Básicas" (working paper, May 1966).

the local authorities' efforts to better account.

7. Improving budget programmes so as to obtain a better economic return from expenditure on education and standardizing operating costs.
8. Increasing the facilities for preparing educational schemes so as to avoid random planning by individual establishments.
9. Decentralising the nation's administrative services and increasing their technical facilities so that they can meet the requirements of regional socio-economic development.
10. Trying to ensure that the teaching staff are professional teachers, and encouraging the work of the teachers' associations.
11. Stimulating pedagogical research.
12. Channelling contributions from the private sector and from international co-operation authorities in such a way as to further national objectives and the Government's educational policy.

The Commission proposed for the various educational levels, that the aims of the National Development Board in the 1967-1970 Plan should be:

1. To eliminate illiteracy and reduce educational inequality as between: the sexes, urban and rural areas, and the various socio-economic regions.
2. To generalise primary education.
3. To reorganise secondary education by introducing a basic general-studies course and flexible and varied vocational courses.
4. To encourage and co-ordinate the application at national level of new intermediate training curricula.
5. To adapt teacher training and refresher course curricula strictly to the projected requirements of the educational system, by closer co-ordination of institutions and by training more teachers in scientific and technical disciplines.
6. To harmonize the development of higher education by regrouping the universities and colleges on a regional basis, in such a way as to combine a higher degree of specialisation with a more equitable distribution of educational activities in each socio-economic region.

7. To plan the quantitative expansion of secondary (vocational) education at the intermediate and advanced levels according to the forecasts for placement opportunities, numbers and types of fully trained persons required, educational flows and the numbers to be trained in each branch, discipline and specialisation for each of the various socio-economic regions.

It is on the basis of these strategic considerations that the present study has been prepared as a contribution to the work of the Education and Human Resources Commission on the Economic and Social Development Plan for 1967-1970. As will be seen in detail in the chapters that follow, the aims of Peruvian development can be translated into manpower requirements at different educational levels, on the basis of which it is possible to make educational projections for the future. It should therefore be emphasized that the present analysis does not constitute and educational plan, although it does mark a vital stage in the national planning process and could well serve as a point of departure for the technical studies of the Commission for the Plan.

Chapter 3

ECONOMIC DEVELOPMENT AND HUMAN RESOURCES

3.1. Methodological Introduction

The appraisal of the existing education system has brought out the marked expansion that has taken place at practically all levels, especially in the past decade. Fundamentally, the extension of education is based on a growing awareness of the usefulness and necessity of education in a dynamic and rapidly developing society. The education system is expected to provide workers with the knowledge and skills needed to change to other economic activities or to other jobs, thereby improving their standard of living and social status. From this angle education is seen as the vehicle par excellence of social mobility.

Education, however, is a vehicle which must be steered. First, it requires large sums of money - it now absorbs more than 5 per cent of the gross domestic product. Secondly, the achievement of social mobility will depend on the degree of economic development for which society is able to harness its potential energies. This close interdependence calls for educational planning geared to the desirable and attainable objectives of economic and social development.

The most rational and practical means of establishing this co-ordination between general and educational development consists in forecasting the human resources needed, since these are both a vital factor for social and economic development and, at the same time, essentially the "product" of the education system.

This is what has been attempted in this Report by applying the methodology used for the Mediterranean Regional Project carried out under the auspices of OECD(1), but adapted to meet Peruvian needs and conditions. For example, the demographic growth rate created no problems for the Mediterranean countries, whereas in Peru, where the rate is very high, a relatively small, active population must provide for the large number of young people not yet old enough to work. In addition, newcomers to the labour market represent a large proportion of the active population, and there are serious difficulties in the way of achieving full employment while trying to improve productivity. The agricultural reform now in operation will have serious repercussions on the changes, in occupation and level of productivity in agriculture, and specialists must be trained for this sector, land-surveyors, and agricultural engineers for example. The government's large-scale road and public works programme for the more backward areas is also part of a deliberate employment policy, since building is, in fact, a transition sector and, therefore, tactically very important.

Two important methodological innovations have been made in this Report: (1) a three-dimensional classification of the active population has been used (breakdown by economic sector, occupational category and educational level), thus allowing us to make a detailed study of the differences in the educational standards of each occupational group in the different economic sectors; (2) in the forecasts of active population, a distinction has been made between the "survivors" from the present manpower stock and newcomers to the labour market, thus making it possible to determine education's tasks much more precisely.

Forecasts of manpower needs were made as follows:

1) Forecast the long-term trend of the overall gross domestic product with a breakdown by sector;
2) Make a long-term estimate of the total active population, based on demographic forecasts and activity rates, with a breakdown by sex and age-group;

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(1) See: Herbert S. Parnes - "Educational Planning for Economic and Social Development", OECD, Paris 1963.

3) Make a sector distribution of total future employment, on the basis of increased production and estimated trends of labour productivity, for each economic sector;

4) Make a critical analysis of the present utilisation of human resources based on census figures and by using a three-dimensional classification: economic activity, occupational category, educational level;

5) Forecast the occupational structure for manpower, based on the above-mentioned analysis and making particular use of international and inter-sectoral comparisons;

6) Determine the future trend for the manpower "stock", on the basis of deaths and retirements, with a breakdown by occupational category;

7) Determine net human resource requirements for the forecast period, by occupation, by substracting the "survivors" of the present manpower stock from the total needs for the year in question;

8) Define the educational characteristics of the manpower in each occupational category, and convert these characteristics into a demand for educational services.

This method was a wise choice for various reasons:

1) By treating educational planning from the human resources angle, priority has been given to that portion of the population participating directly in production, it is, in fact, known that education has a direct influence on the economy, since it allows the best use to be made of the new resources which will go to strengthen the educational effort;

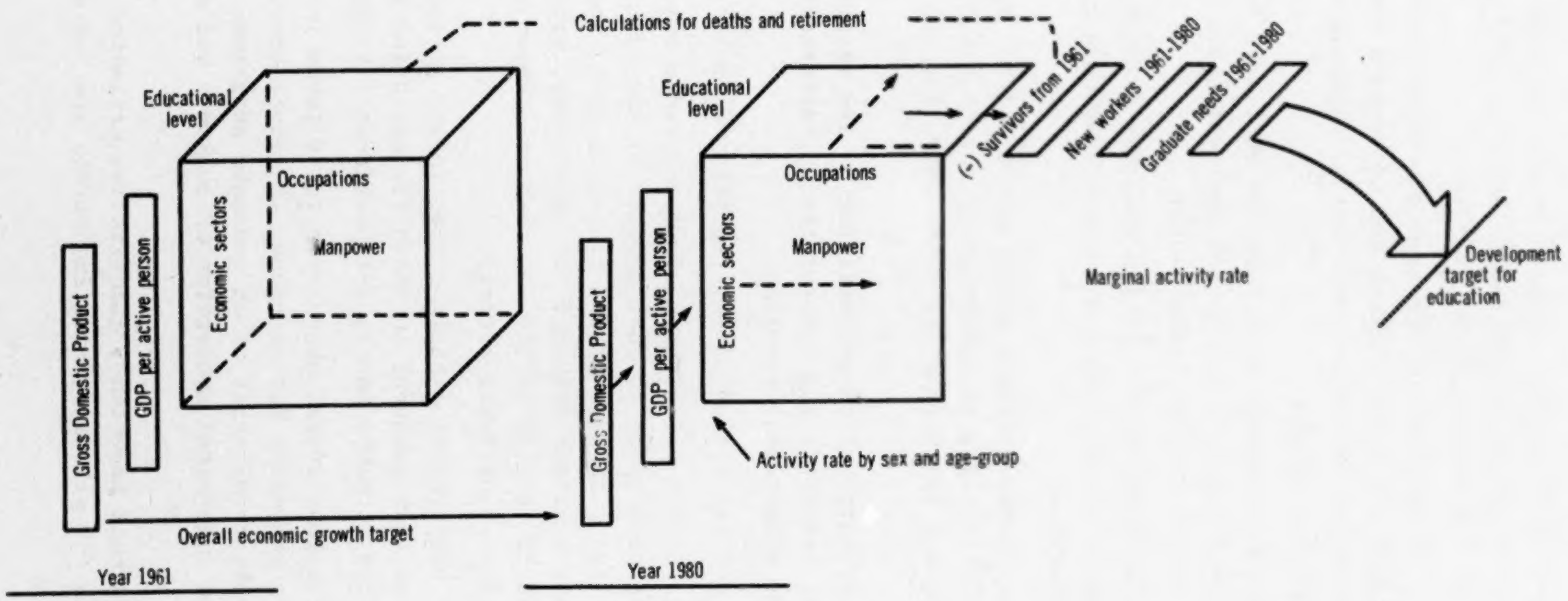
2) Educational planning is closely linked to the sectoral economic forecasts, so that measures intended for education are decided as part of the economic and social development targets.

3) This method allows social objectives to be taken into account, i.e. primary schooling for everyone, and adult education, which are not simple corollaries of an economic programme, but the result of an integrated conception of economic and social development.

4) Finally, and most important, quantitative estimates of manpower requirements for all categories and levels are indispensable for

Diagram 3-01

LONG-TERM FORECASTS OF GRADUATE REQUIREMENTS, BY EDUCATIONAL LEVEL


Calculations for deaths and retirement
Educational level
Occupations
Economic sectors
Manpower
Gross Domestic Product
GDP per active person
Overall economic growth target
Year 1961
Educational level
Occupations
Economic sectors
Manpower
Gross Domestic Product
GDP per active person
Activity rate by sex and age-group
Year 1980
(-) Survivors from 1961
New workers 1961-1980
Graduate needs 1961-1980
Marginal activity rate
Development target for education

the planning of economic and social development, and allow more precise planning of enrolment, building, financing, etc.

Forecasts of manpower requirements and the "fixing" of educational targets must both, by their nature, be on a long-term basis. The constitution of human capital usually takes a long time, and any changes to the education system require a series of policy reforms and measures whose effect also is long-term. The forecasts in this survey have therefore been made to extend over a period of almost 20 years, from 1961 to 1980.

3.2. Trends in gross domestic product up to 1980

Long-term forecasts of manpower requirements and educational needs must be made in the framework of economic and social development. Theoretically, when this framework is incorporated into a government plan, it constitutes the base for long-term growth targets and investment programmes. In actual fact plans are usually short- or at most, medium-term, and possibly accompanied by estimates of medium- or long-term production targets. Even though the Peruvian economic and social development plan has not been completely worked out, the National Planning Institute has already prepared Public Investment Programmes for 1964-1965 and 1966, indicating overall production targets up to 1970. Forecasts are based on alternative hypotheses for annual growth rates of gross domestic product (7.0 and 5.5 per cent). Growth rates have also been projected by economic sector and, in manufacturing, by sub-sector.

A suitable overall growth target must be chosen when planning human resources, since it determines total employment requirements. In this Report a 7 per cent growth target was chosen up to 1973. It would be useful when judging this 7 per cent target to examine the GDP trend in Peru in recent years, to compare growth rates in other countries and to examine briefly the reasons for choosing the highest growth rate.

Table N° 3-01

GROSS DOMESTIC PRODUCT, POPULATION, PER CAPITA PRODUCT
AND GROWTH RATE OF GROSS DOMESTIC PRODUCT

	Actual			Forecasts			
	1950	1955	1960	1965	1970	1975	1980
Gross Domestic Product (in millions of Soles, at 1960 prices) . . .	34,411	44,162	55,650	75,545	105,960	145,948	197,026
Population (in thousands). .	7,969	8,790	10,025	11,650	13,586	15,868	18,527
GDP per capita (in 1960 Soles)	4,318	5,024	5,551	6,485	7,799	9,198	10,635
GDP growth rate (%) . .		50-55 5.1	55-60 4.7	60-65 6.3	65-70 7.0	70-75 6.6	75-80 6.2

The average annual growth rate for GDP between 1950 and 1964 was 5.3 per cent; the population growth rate was 2.5 per cent, so that per capita GDP increased by 2.6 per cent, but with considerable fluctuations from one year to another and between the first and second halves of the period. From 1950 to 1957 the average rate was 4.6 per cent, and from 1958 to 1964 6.0 per cent, including the four-year period from 1959 to 1963 when the growth rate reached its maximum of 8.1 per cent, due mainly to the yield from the large investments in mining and to the rapid expansion of the fishery industry. Although this increase has done little to improve the living standards of the least favoured classes of the population it does give an indication of the economy's capacity for expansion.

Table 3-02 gives comparative data illustrating the growth rates for the GDP and the population of a number of countries.

Diagram 3-02

POPULATION, TOTAL GDP AND GDP PER CAPITA TRENDS, 1950-1980

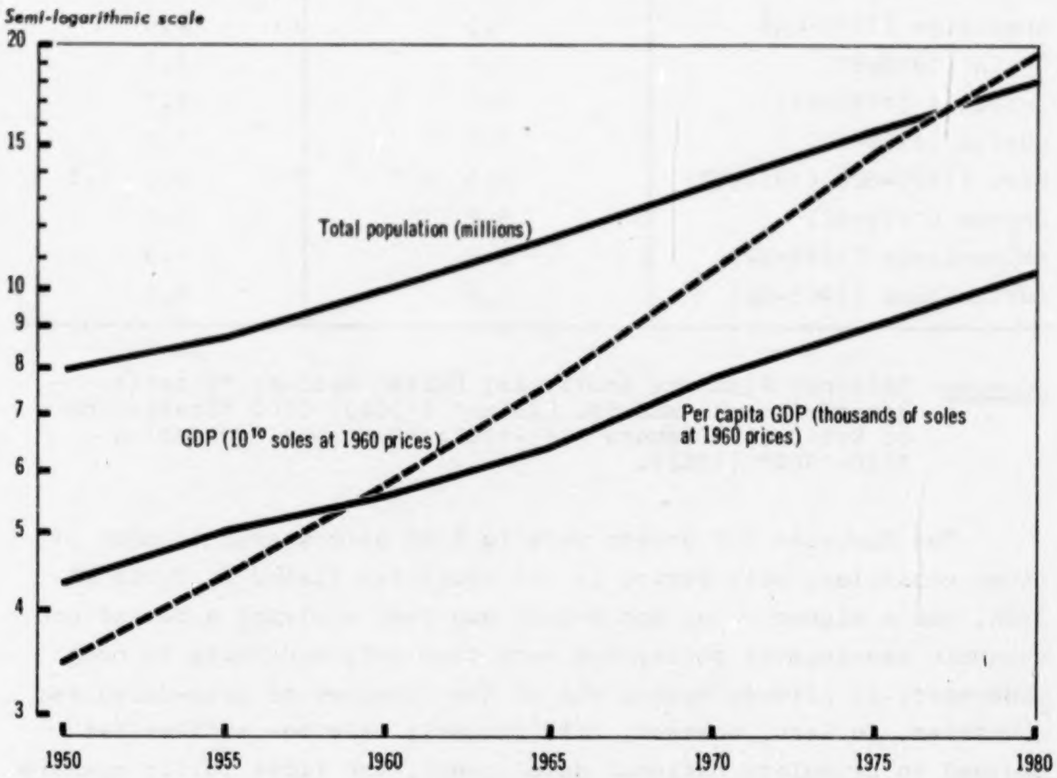


Table N° 3-02

COMPARATIVE GROWTH RATES FOR GROSS DOMESTIC PRODUCT AND POPULATION

(Cumulative rates based on constant prices in the monetary unit of each country)

Country	Growth rate of gross domestic product	Growth rate of population
Argentina (1950-62)	1.5	2.0
Chile (1950-62)	3.1	2,3
Colombia (1950-62)	4.6	2.7
Mexico (1950-62)	5.8	3.0
Peru (1950-62) (1955-62)	5.5 5.7	2.5 2.8
Greece (1955-62)	5.5	0.8
Netherlands (1955-62)	3.9	1.3
Switzerland (1955-62)	3.9	0.6

Sources: National Planning Institute; United Nations "Boletín Estadístico de América Latina" (1964); OECD "Statistics of National Accounts 1955-1962; "Manpower Statistics 1950-1962" (1963).

The Peruvian GDP growth rate is high as compared to that of other countries; only Mexico in the countries listed in Table N° 3-02, has a higher rate, and Mexico has been applying a social and economic development policy for some time and, according to many observers, is already moving out of the category of less-developed countries. In Peru, however, only recently have the authorities decided to stimulate national development, the first policy measure being the adoption of a public investment programme.

Various reasons support the hypothesis of an annual growth rate of 7 per cent. Peru has a wide range of natural resources, many of them virtually unexploited. The opening up of new transport and marketing networks, which are the corner stones of the public investment programme, will create many opportunities for investment outside the coastal zone and thereby enlarge the markets of existing industries.

Exports are well developed, though not very varied, and provide a valuable source of foreign currency for financing imports of capital goods. The balance of payments situation is good compared with that of other developing countries. The foreign currency reserves, supplemented by a slight rise in prices, serve the double purpose of increasing the country's capacity for obtaining long-term international financing for development projects and of stimulating private investment.

Peru is starting from a fairly small basis, and so provides ample investment opportunities, especially in the replacing of imports by domestic products for which a market already exists and for the creation of new industries. All this would be encouraged by a rapid growth rate.

The government has set up an economic and social development plan (1967-1970), which includes basic reforms, large public investments in the agricultural infrastructure, building and education, and incentives to encourage private investments for establishing new industries and regions.

Although the high growth rate of the population means an even greater expansion in production to raise the per capita income, at the same time the increase in the potential supply of human resources may itself help to achieve this expansion.

Peru is a country with a low population density and great production potentialities in areas still sparsely inhabited. Settlement projects, public works, and the encouragement of handicrafts, if suitably planned and implemented, should make it possible to use techniques with low capital but high manpower intensity to promote economic expansion in different areas.

The overall economic forecasts up to 1970 correspond to the production targets established by the National Planning Institute in its 7.0 per cent hypothesis. Beyond 1971, longer-term forecasts have been made in line with the targets of human resources and education planning, after prior consultation with the Macro-Economic Directorate of the National Planning Institute.

It has been estimated that, from 1974 onward, there will be a progressive fall in the growth rate of the gross domestic product, which should average approximately 6.2 per cent. There are several reasons for adopting a lower hypothesis for the second half of the period. International experience has shown that it is very difficult to maintain a 7.0 per cent growth rate over a long period; when expansion did reach this figure it was usually for a short period only.

A high and sustained growth rate, especially where this is accompanied by large public investments in the infrastructure (necessarily long-term), the danger of inflationary pressures grows. Structural distortions may take place which temporarily discourage new investments, thus causing bottlenecks in certain industries, especially those producing capital goods. The problem is mainly due to the acute shortage of highly skilled workers, middle-level technicians and professional personnel. When employment increases rapidly, specific shortages occur in certain skills, particularly in "new" or "expanding" industries; the result may be a temporary decline in certain key sectors.

As public and private investment increases, with consequent pressure on the balance of payments, it becomes increasingly necessary to obtain new, long-term foreign loans, thus complicating the debt system. Usually a period of consolidation is necessary to restore the balance, and correct certain bottlenecks in the structure.

The temporary character of the overall economic forecasts mentioned here should be stressed, however; these forecasts were made in conjuction with the Macro-Economic Directorate of the National Planning Institute, and were to facilitate the work and to meet the specific needs of this Report. Because of this, no cross-check has been made with corresponding details for investments, effects on the balance of trade, etc. These forecasts will probably need revising as the National Planning Institute completes its medium-term forecasts for the 1967-1970 Plan. The same remarks also apply to the sector forecasts, shown in Section 3.3.

3.3. Breakdown by Sector of the Gross Domestic Product

The process of economic growth is marked by continuous changes in the structure of national production. Some sectors, more dynamic than others, make an ever-increasing contribution to the national product. Table 3-03 shows recent changes in the Peruvian economy, according to official data supplied by the National Planning Institute.

Table N° 3-03

BREAKDOWN OF GROSS DOMESTIC PRODUCT, BY ECONOMIC SECTOR, 1950-1964

Economic Sector	GDP in millions of Soles (at constant 1960 prices)				Breakdown in per cent			
	1950	1955	1960	1964	1950	1955	1960	1964
Agriculture	8,860	9,787	11,317	13,998	25.7	22.2	20.4	19.6
Fisheries	167	238	785	1,266	0.5	0.5	1.4	1.8
Mining industries	1,831	2,793	4,908	5,448	5.3	6.3	8.8	7.6
Manufacturing industries	5,349	7,777	10,467	13,952	15.6	17.6	18.8	19.6
Construction	1,179	1,955	1,768	2,921	3.4	4.4	3.2	4.1
Power	(a)	(a)	214	314	(a)	(a)	0,4	0,4
Transport	1,586	2,393	3,009	3,816	4.6	5.4	5.4	5.3
Commerce	5,512	7,452	9,280	12,528	16.0	16.9	16.7	17.6
Banking, Insurance	1,050	1,635	2,062	2,639	3.1	3.7	3.7	3.7
Housing	3,201	3,661	4,470	5,261	9.3	8.3	8.0	7.4
Public Sector	3,489	3,767	4,291	5,527	10.1	8.5	7.7	7.8
Services	2,187 (b)	2,704 (b)	3,079	3,602	6.4 (b)	6.2 (b)	5.5	5.1
Total	34,411	44,162	55,650	71,272	100.0	100.0	100.0	100.0
Main Sectors:								
- primary					31.6	29.0	30.6	29.1
- secondary					23.6	27.5	27.7	29.5
- tertiary					44.8	43.5	41.7	41.4

NOTES: (a) Included in services
(b) Includes power

Agricultural contribution to GDP has decreased relatively, despite its increase in absolute figures. This decrease, which shows that agricultural production is not keeping pace with the overall growth of the economy, is a fairly common phenomenon when development is based on greater industrialisation. Many other developing countries are experiencing the same trend, as shown by Table 3-04.

Table N° 3-04

CONTRIBUTION MADE BY AGRICULTURE TO GROSS DOMESTIC PRODUCT

In percentages

	1955	1962
Colombia	38.8	34.6
Greece	34.5	28.7
Italy	22.9	16.8

In countries which are already highly industrialised, agriculture's contribution to GDP is still lower, e.g. France (1962): 9.2 per cent, Canada (1962): 6.9 per cent and the United States (1961): only 4.2 per cent.

Although this trend may appear normal, a closer examination of the actual figures shows that agriculture is seriously behind in Peru, and that production is insufficient to ensure the required supply of food products.

From 1951 to 1962, food production increased by only 24 per cent, while population increased by 31 per cent for the same period. Livestock production increased even less, i.e. by 19 per cent.

Since this 24 per cent increase includes production intended for export - exports of sugar, coffee and fruit doubled during this period - the supply of foodstuffs on the home market actually increased by less than 20 per cent in 11 years.

Statistics concerning the use made of areas under cultivation confirm that agricultural development is insufficient to satisfy the internal needs of the country. The area under cultivation for export crops (cotton, sugar and coffee) increased from 220,600 hectares in 1951 to 441,800 hectares in 1962, that of crops for domestic consumption (potatoes, maize, barley, wheat, etc.) increased from only 1,116,300 to 1,266,600 hectares. Over the same period, food imports increased in order to satisfy domestic demand: agricultural imports doubled, meat trebled and milk increased fivefold.

Peru must obviously make an extraordinary effort to bring agricultural production up to the level of economic development the country hopes to attain. The possibilities appear to be favourable: only 2.1 million hectares, or 1.6 per cent of the national territory are under cultivation, and a further 1 million hectares are to be added.

It is not so much a matter of increasing the total area under cultivation, however, for this would entail considerable investments in the infrastructure, as of strengthening the limited resources available. The yield from land already under cultivation should be increased by introducing modern methods (improvement of seeds and varieties of plants and livestock; fertilisers and insecticides; better techniques and machinery for ploughing, sowing, harvesting and threshing), by changing existing farming methods in line with social, economic and technical needs, and by providing farmers with better information and basic training.

The marketing of farm produce which, of course, is closely linked with the communications and storage systems, is also very important. Domestic agricultural consumption appears to correspond to actual production, although there are no statistics available to bear this out; the simple fact of commercializing marginal sectors would mean an increase in production. This type of commercial development would result in some surplus production, essential for industrialisation (now concentrated almost entirely in the urban centres), which in turn depends on agriculture for its supply of food and raw materials.

Unless the increase in domestic food production can be accelerated and delivery of foodstuffs to the industrial centres effectively assured, the benefits of industrialisation will prove illusory. The shortage of primary commodities is the basic cause of inflated prices, which cancel out the real improvement in income and then lead to the progressive importation of consumer goods, to the detriment of imports of productive capital goods.

For these two reasons agricultural production targets should not be fixed solely on the basis of the historical trends which have culminated in the present imbalance of supply and demand, nor on econometric calculations of the demand for agricultural produce, since this is not an effective demand. In this Report we have concentrated on four specific factors for establishing targets for this sector. These are:

1) The substantial increase in population, especially urban population (approximately 4.4 per cent per annum, compared with 1.9 per cent for the rural population);
2) The urgent need to improve the general nutritional level of the population, which is still below scientific standards;
3) The means of ensuring a food supply sufficient to meet the needs of the country, by means of: reforms, intensive farming and the accelerated expansion of the internal trade and communications network;
4) The increasing tendency to process the domestic output of raw materials; this would increase the possibility of replacing imports and so make the economy less vulnerable. The annual average growth of GDP for the agricultural sector has thus been estimated at 5.2 per cent compared with 3.8 per cent in the past. Table N° 3-05 shows past growth rates and forecasts for various sectors of the economy.

The fisheries sector has expanded considerably, especially during the latter half of the 1950s. Almost all fish production is for export; its share in total exports rose from 2.6 per cent in 1950 to 23.3 per cent in 1964; home consumption still remains very small.

This spectacular increase is not likely to continue at the same rate, for it appears that the biological limits have already been reached, if not exceeded.

International competition on the world markets is also increasing.

The extractive industries, which include petroleum as well as mining and quarrying, are becoming more important on the domestic market. For the past 15 years minerals and petroleum have represented approximately 45 per cent of the total value of exports. Previously, most of the foreign capital was invested in this sector, and, although the situation has changed somewhat since the Second World War, the extractive industries are still predominantly under foreign control and management, making it difficult to forecast future development, whether in the short or long term.

Table 3-05

ANNUAL GROWTH RATES OF THE GROSS DOMESTIC PRODUCT BY ECONOMIC SECTOR (a)

PERIODS / SECTORS	1950/55	1955/60	1960/65	1965/70	1970/75	1975/80	1950/65	1965/80	1950/60	1960/70	1970/80
Agriculture	2.0	2.9	5.1	5.7	5.2	4.7	3.3	5.2	2.4	5.4	4.9
Fisheries	7.3	27.0	12.8	7.0	4.3	4.7	15.4	5.3	16.7	9.8	4.5
Mining industries	8.8	11.9	3.5	6.0	6.0	4.6	8.0	5.5	10.4	4.8	5.3
Manufacturing industries	7.8	6.1	7.3	8.3	8.3	8.5	7.1	8.4	6.9	7.8	8.4
Construction	10.6	2.0	12.9	11.2	9.7	7.7	7.0	9.5	4.2	2.0	8.7
Power	(b)	(b)	10.1	10.8	11.1	11.0	-	11.0	-	10.4	11.0
Transport	8.6	4.7	5.9	8.6	8.1	7.4	6.4	8.0	6.6	7.2	7.7
Commerce	6.2	4.5	7.5	7.1	6.2	5.5	6.0	6.3	5.3	7.3	5.9
Banking, insurances	9.3	4.7	5.7	7.0	6.6	6.0	6.6	6.5	7.0	6.4	6.3
Housing	2.7	4.1	4.3	4.5	4.5	4.5	3.7	4.5	3.4	4.4	4.5
Public sector	1.5	2.7	7.1	7.5	7.2	5.7	3.7	6.8	2.1	7.3	6.4
Services	4.3 (c)	-	3.9	3.9	3.3	3.3	-	3.5	-	3.9	3.3
Total	5.1	4.7	6.3	7.0	6.6	6.2	5.4	6.6	4.9	6.7	6.4

NOTES : (a) GDP at constant 1960 prices.
(b) Included in Services.
(c) Includes power.

Economic progress in Peru, as in so many developing countries, depends on the speeding up of industrialisation. Recent experience is encouraging, the industrial sectors as a whole (i.e. manufacturing industries, construction and power) having shown a substantial increase - 7 per cent per annum - for the period 1950-1960.

A comparison with the overall economic growth rate - 5.4 per cent - shows an "industrialisation coefficient" of nearly 1.3, which is higher than the average calculated by ECLA for Latin America.

This expansion has not been uniform for all branches. A more detailed breakdown is needed for analytical purposes and planning, especially of the manufacturing industries, and industries were therefore classified in the following five sub-sectors:

1) Foodstuff manufacturing industries (20)(1), beverages (21) and tobacco (22);
2) Textile manufacturing industries (23), clothing and footwear (24);
3) Chemical products industries (31) and by-products of petroleum and coal (32);
4) Metallurgical industries, including basic metals (34), metal products (35), machine construction (36), electrical appliance, accessories and goods manufacture (37), transport equipment manufacture (38);
5) Other industries, such as timber and cork manufacture (25), furniture (26), paper (27) and printed goods (28), industries manufacturing other leather goods (29), rubber goods (30), non-metallic mineral products (33), and other miscellaneous industries (39).

This classification, while intended to avoid excessive detail, was so conceived as to ensure a correct balance between the homogeneity and heterogeneity of the various activities. The first two sub-sectors produce almost exclusively consumer goods, though they differ from the point of view of demand. The metallurgical industries produce mainly equipment and durable consumer goods, the remainder of this group having a fairly varied content. Labour mobility was also used as a criterion in the sense that it appears to be greater within each sub-sector than between the different sub-sectors. We shall come back to this question later.

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(1) The numbers in brackets refer to the sector codes defined by the National Planning Institute in "Clasificación de la Economía Peruana por Sectores Productivos" DP-MACRO/1-65, 15 February 1965.

In the absence of complete and reliable information it is not possible to make an accurate judgment of the real growth achieved, or of the long-term changes occurring in the industrial sub-sectors. The details concerning the value of production published by the Ministry of Promotion in its yearbook entitled "Industrial Statistics" cover only the "registered establishments" which furnish information. Statistics for 1961 (for which comparable material is available) show that the 3,200 establishments concerned cover only 31 per cent of all industrial employment, but represent 83.5 per cent of the net value of industrial production. There is obviously a high degree of inequality: most industrial employment apparently occurs in a very large number of small establishments whose contribution to total production is relatively small. It seems reasonable, therefore, to extrapolate the distribution of the net value of production among the five sub-sectors indicated, while assuming that the contribution of the small establishments is divided in the same proportion as for the registered establishments.

Similar data, collected by the National Planning Institute, provide a comparison over a period of four years. See Table Nº 3-06.

The exceptionally rapid expansion of the metallurgical sector is mainly due to the starting up of the Chimbote iron plant. The chemical and miscellaneous industries have also expanded, each averaging more than 7 per cent per annum. The consumer goods industries (foodstuffs and textiles) fell relatively, their contribution to GDP going from over 53 per cent to barely 45 per cent over the four years. Although this does not mean that the process of industrialisation is partial or unilateral, it is to a large extent adapting itself to actual demand. A similar trend is noticeable in the consumer goods industries which are producing high quality goods suitable to meet the demand of the high income brackets.

Development targets should include a clearly expressed desire to correct such deficiencies or imbalance in the pattern of supply, particularly to achieve a fairer distribution of wealth. The influence of government on the progress of industrial activities, by its nature, is very limited, most activities being in the hands of private enterprise.

Government participation in the productive sector of the economy through direct investment has been calculated at 18.3 per cent of the gross capital formation over the period 1960-1964, 13 per cent of which went to the manufacturing industries, especially to the production of capital goods and intermediate products.

Table 3-06

BREAKDOWN OF GDP AND GROWTH RATE BY SECTOR IN THE MANUFACTURING INDUSTRY

Sub-sectors in the manufacturing industry	GDP (in millions of Soles at constant 1960 prices)					Percentage breakdown					GDP Annual growth rate			
	1961 (a)	1965 (b)	1970	1975	1980	1961	1965	1970	1975	1980	1961/65	1965/70	1970/75	1975/80
Food products	4,007	4,781	7,046	10,474	14,892	35.0	32.1	31.9	31.9	30.1	4.5	8.1	8.3	7.3
Textiles and ready mades	2,142	2,428	3,411	5,024	7,421	18.6	16.3	15.4	15.2	15.0	3.2	7.1	8.1	8.1
Chemical and petrolum products	1,416	1,887	2,933	4,421	6,679	12.2	12.7	13.2	13.4	13.5	7.4	9.3	8.6	8.6
Metallurgy	1,934	3,119	4,495	6,440	10,934	16.8	21.0	20.3	19.5	22.1	12.7	7.6	7.5	11.2
'Others	2,015	2,668	4,260	6,602	9,549	17.4	17.9	19.2	20.0	19.3	7,2	9,8	9.2	7.7
Total	11,514	14,882	22,146	32,961	49,476	100.0	100.0	100.0	100.0	100.0	6.6 (c)	8.3	8.3	8.5

(a) Estimates on the basis of data for establishments registered in "Estatistica Industrial, 1961".

(b) According to the National Planning Institute.

(c) 7,5 % for the period 1960-1965.

Diagram 3-03

GROWTH OF INDUSTRIAL GDP, BY SUB-SECTOR, BETWEEN 1965 AND 1980

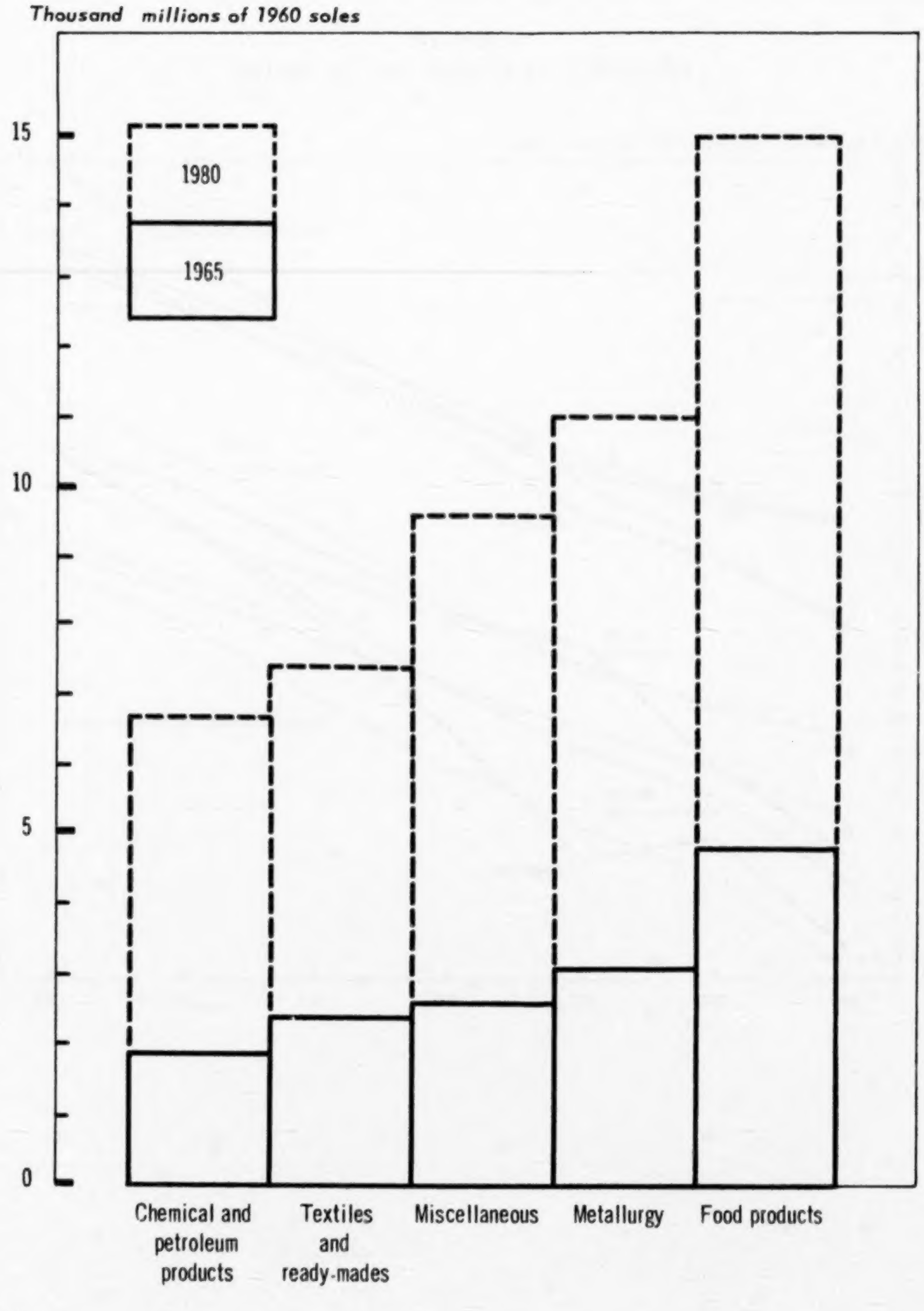
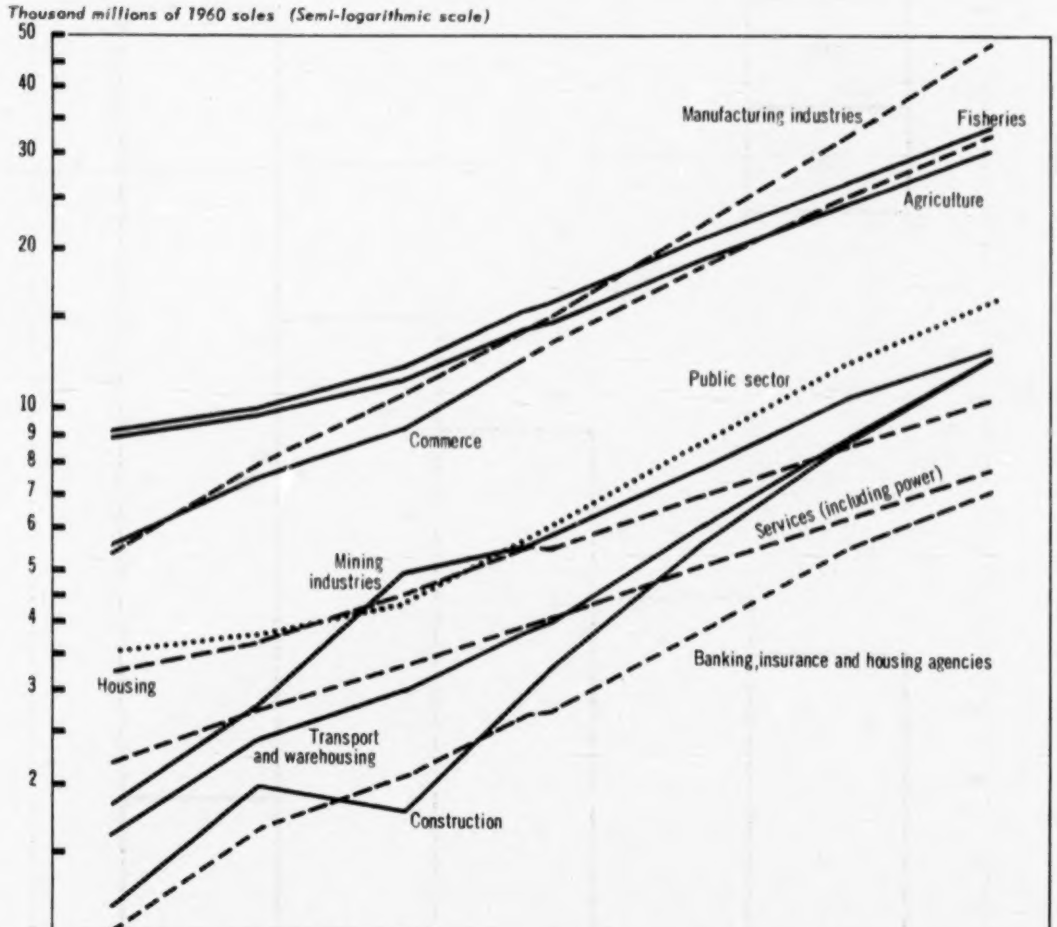


Diagram 3-04

GDP TRENDS, BY ECONOMIC SECTOR, 1950-1980



Any stimulative action on the part of the government to influence the private sector to develop in the desired direction must therefore be indirect. If such intervention is to be effective the objectives must be defined unambiguously and consistent measures must be adopted. In Peru economic policy objectives favour the rapid setting up of a modern system of industrial production. The Promotion of Industry Act (1959) explicitly encourages efficient production techniques with a high capital intensity, at the same time as a liberal system of permanent or temporary tax concessions. A policy of this kind, however, could hamper the attainment of other social and economic development objectives. In principle, the 1959 Act favours the rapid growth of industrial production in those sectors where the technical and financial conditions, and the attitude of the firms, lend themselves to large capital investments. Generally speaking, the effect of these investments is to intensify the amount of capital employed per worker ("capital deepening investments") rather than to create new employment opportunities. This type of investment and the use of modern methods require highly skilled workers; the supply of such workers is comparatively small and at the same time workers without these skills find themselves left out when highly technical processes are used. Once a certain technological level has been reached cheap labour may, through lack of training, prove costly.

In other industrial sectors where conditions do not favour high technical productivity investments either because of a lack of technical/financial capacity as in handicrafts, or because of the existence of a socio-political climate hostile to innovation as in part of the textile industry, there is a danger that the expansion of production will be delayed. Competition from unskilled, cheap labour in these sectors also has a negative influence insofar as it impedes the capitalisation of production and keeps down productivity. These backward sectors may benefit indirectly from economies in other sectors originating in the more dynamic industries (e.g., increased need for repairs as a result of the growing production of durable consumer goods) but no proportional estimate can be made of these indirect effects.

The disparities, the dualism between modern and traditional industrial activities and between large and small undertakings, are constantly widening and the inequalities referred to are becoming more marked in the production structure. Such a trend will not give rise to any great increase in the number of jobs for a continuously growing population and its effects on one of the other objectives of social and economic policy - a fairer distribution of income - will definitely be negative.

This brings out the obvious need for an overall plan of social and economic development, preferably on a long-term basis, in which the different objectives are considered and co-ordinated as and when the conditions in each sector best allow them to be attained.

Measures which encourage industrialisation should therefore be distinguished from the rest, and particular attention paid to the advantages to be obtained from modernisation and the expansion of medium-scale industries. Experience of economic development has clearly shown that these industries play a very important part in the development process, since they adapt themselves more smoothly and more competently to the estimated requirements, make more efficient use of the limited capital at their disposal and, last but not least, encourage the technical and organisational talents of their staff. It is also logical that the basis of regional development and industrial decentralisation should be the medium-sized firm. There is some statistical evidence that, notwithstanding the close correlation between capital intensity and product per worker, this ratio(1) is not always optimum in the largest establishments. Information, obtained from 1,400 selected undertakings by the Ministry of Industry and Public Works in 1963, deserves mention here though its value is relative. It gives some idea of the importance of these two factors in a breakdown by industrial sub-sector and by size of establishment (see Table N° 3-18).

Estimates of the future development of the various industrial sub-sectors have taken account, as far as possible, of spontaneous growth trends and of the slant the government should give to ensure a balanced growth, corresponding to the best combination possible of social and economic objectives. These estimates are to provide supplementary information only, since there are not yet sufficient data for deciding what this combination should be, let alone a clear statement of economic policy targets.

For the purposes of this survey (which, let us repeat, does not claim to establish detailed or precise targets for future economic development) the expansion targets for the different sectors were fixed by global methods. Econometric factors of international comparison were used, when calculating the growth elasticity of the various industrial sectors, based on the empirical observation of the corresponding growth model(1). The considerations mentioned above on the effect of capital intensity have also been taken into account. This effect is stronger in some sectors than in others, and the trend will probably be for it to become stronger in future, with the corresponding consequences for production.

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(1) In fact, identical to the capital:output ratio.

The estimates thus obtained proved to be practically the same as the DGP forecasts, by branch of industry until 1970, made by the National Planning Institute in its "1964-65 Programme of Public Investments". They were therefore maintained for the period ending 1970, with a few adjustments to make them more comparable with the series for recent years.

For the sector-growth forecasts up to 1980 - a longer period than that adopted by the National Planning Institute - the relative magnitude of the needs and possibilities of expansion were taken into account. A detailed forecast was not to be considered, and, even had it been possible, the mathematical side would always have to be supplemented by the discretionary judgments which always plan an important part in any planning exercise.

A fairly substantial growth in production has been estimated for the food manufacturing industries, especially in the early stages of the period of reference, and for the same reasons as those given in connection with the development of agriculture. The elasticity of growth in this sector in relation to agricultural development should increase considerably, a growing proportion of agricultural produce being processed by national industries. These are subject to rapid technological innovation but affecting the processes rather than the final products. The food products market may therefore be considered fairly stable, and demand to show a high degree of elasticity.

Similar factors encourage the expansion possibilities of the textile industry, where production suffers most from lack of organisation. Capital intensity and labour productivity are extremely low (as shown by Table N° 3-18), chiefly because of too many low skilled workers. Despite protection against foreign competition, barely 7 per cent of the cotton produced by Peru in 1962 was processed by its own textile industry. In 1951 the proportion was 25 per cent, indicating a trend which is in contradiction to the concept of development or of replacing imports by domestic products.

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(1) H.B. Chenevry "Patterns of Industrial Growth", American Economic Review, Sept. 1960.

The continuation of a high rate of growth in the chemical industries is forecast on the basis of past trends. The production of chemicals in particular must be increased to make possible greater productivity in agriculture through the more extensive use of artificial fertilisers.

The metallurgical sector has recently strengthened its production capacity and in the near future will make more intensive use of this capacity before undertaking new large-scale expansion. The development of the various industries assigned to the fifth group is closely linked with the growth of the other sectors, especially construction. This link will be examined presently.

In short, the forecasts in this survey put the stress on an uninterrupted and accelerated industrialisation of the Peruvian economy. They imply the country's intention to secure a more balanced growth based on the many objectives the nation hopes to attain. The government's influence in orienting development in this sector is of vital importance.

Modern, efficient industry requires large capital investments and highly skilled, rather than large numbers, of workers. The government must consider such requirements in the light of its social and economic objectives, for its long-term plans must decide the type and amount to use of the tactical means available (public investments, State marketing policy, taxation and fiscal policy) to ensure the best possible use of the potentialities for increasing and distributing the national wealth.

Although the possibilities of creating new jobs are limited in the manufacturing sector, there are better possibilities in construction, where the State has more scope to carry out an active employment policy. Between 1960 and 1964, direct government investment in construction represented 45 per cent of the total.

The ambitious schemes for building and extending the road network - needed in particular for developing agriculture - will absorb an amount of both capital and manpower resources in the future. However, in view of the rapid increase in the population, housing needs are just as urgent. For new families alone the increase in the number of houses is estimated at 4 per cent per annum, or more than 75,000 units. Present production is not a quarter of this figure. More than half of the existing houses should also be replaced, since they are very old and lack adequate sanitary arrangements. It is difficult to decide whether the situation is worse in the urban or in the rural areas. The population in the eight largest towns in Peru trebled between the 1940 and 1960 Census. As a result of the migration to the towns a considerable proportion of the urban population now lives in "shanty towns". In Lima-Callao there are approximately 20 per cent, and in new towns, such as Chimbote, about 80 per cent.

The most recent - 1961 - National Housing Census, stresses the seriousness of the housing situation. Between 60 and 70 per cent of private houses have fewer than three rooms. Almost 80 per cent have no running water and 70 per cent lack electricity. Only half of these houses have sanitation. These data refer to urban areas; those for rural areas indicate that the situation is even worse.

Building, however, has first priority on the list of sector development plans. To complete the vast construction programmes, special appeal must be made to the initiative and effort of those directly concerned; 85 per cent of the work in house building is done by the owner-occupants, and the State should increase its financial and technical aid to them.

Direct participation by the State in building should also be increased as part of its employment policy. Building methods should take into account the large supply of labour available and keep capital down as low as technical methods allow. This solution does not require a high level of skill from most of the workers and at the same time would make it possible to economise the limited resources of capital. The organisation of this type of work is basically the same as that of agriculture (group work in the open, under the supervision of foremen), and for this reason building in both the towns and rural districts can serve as an intermediate stage by preparing workers for future employment in industry, with its more exacting standards of skill and labour discipline.

Peru now apparently finds itself at the most suitable stage for undertaking infrastructural works, such as the building of houses, hospitals, roads, ports, and power and irrigation works, since labour will tend to become more expensive later, as the experience of the developed countries shows, and processes with greater capital intensity must then be used.

Although the main reason for developing the building industry is to provide work, the indirect effect on the other sectors is also appreciable.

Surveys in other countries, i.e. Colombia and Chile, show that the indirect repercussions from building on both production and employment in other sectors are considerable. In Chile, for instance, for every 100 workers directly employed in construction a further 140 are indirectly employed (producing materials, etc.).

Transport is unquestionably the sector which benefits most from increased building activity, especially of roads and ports. This sector, in its turn, gives an impetus to trade, essential for increasing agricultural production and marketing, and for integrating the hinterland into the new economy. It is significant that, up to now, less than 5 per cent of the industrial production of the coastal zone has been reaching the interior of the country, which lacks the purchasing power and markets for these goods. Trade and transport also play an important part in achieving an internal balance of trade, and thus mitigate the social and economic dualism in Peruvian society.

This is, however, a very slow process which will take several decades. In the meantime, communications and markets are still technically defective and continue to give rise to speculation and inefficiency in the producer/consumer circuit, plus the symptoms of obvious distortion in the form of artificial shortages and inflated prices. Although long-term forecasts show a progressive acceleration in the growth of commercial activity, the economic effects must be considered of the gradual reorganisation and rationalisation of this sector, expressed by a reduction in its relative part in the national product.

The forecasts for the other service sectors have in fact been influenced by similar considerations, particularly personal services, obviously over-developed, a typical feature of a predominantly traditional society. This point will be examined in greater detail when we discuss the structure of employment.

The role of government administration in national development is very important and will certainly be more so in future. Since its function is mainly one of stimulating and guiding, it's contribution to the national product will not necessarilly increase progressively. As Table N° 3-07 shows, the public sector's contribution will remain practically constant between 8.2 and 8.3 per cent of the gross domestic product, i.e. increasing at the same rate as the total national product.

It is interesting to compare the future structure of the national product, as shown by the sector forecast in Table N° 3-07 with that for other countries. The present economic structure of Peru is between that of Colombia and Chile but, according to the forecast, in 1980 Peru will probably be close to such countries as Argentina and Italy.

The secondary sector will move ahead of the services sector, while the relative importance of the primary sector will continue to fall. These trends are normal in the process of economic development.

3.4 Estimation of active population in 1980

The foregoing analysis of the present and future composition of production and growth rates by economic sector, the basis for overall forecasts, allows a forecast to be made of future total employment and its breakdown by economic sector.

Overall and sector employment forecasts have been approached from two angles. Demographic factors, and particularly the age-structure of the population and its activity rate, fix the maximum limit of total future employment. The growth rates for production in the various sectors, combined with changes in productivity, serve as a basis for the breakdown of total employment by sector. Forecasts of future employment thus rest on two corner stones providing double means of checking the feasibility of the forecasts.

The initial estimate of total employment for 1980 was made on the basis: of forecasts for the total population, of certain traditional characteristics in the composition of the labour force, of a series of qualitative judgments concerning the activity rate - by age-group and sex, and, lastly, of a comparison of these data with similar information for other countries.

Table 3-07

BREAKDOWN OF GDP BY ECONOMIC SECTOR, FORECASTS FOR 1965-1980

Economic Sector	GDP in millions of Soles (at 1960 constant prices)				Percentage breakdown			
	1965	1970	1975	1980	1965	1970	1975	1980
Agriculture	14,505	19,179	24,648	31,032	19.2	18.1	16.9	15.8
Fisheries	1,435	2,013	2,479	3,123	1.9	1.9	1.7	1.6
Mining industries	5,817	7,823	10,463	13,076	7.7	7.1	6.9	6.6
Manufacturing industries	14,882	22,145	32,961	49,476	19.7	20.9	22.6	25.2
Construction	3,248	5,510	8,751	12,686	4.3	5.2	6.0	6.4
Power	346	578	978	1,648	0.5	0.6	0.7	0.8
Transport	4,004	6,040	8,900	12,686	5.3	5.7	6.1	6.4
Commerce	13,296	18,755	25,377	33,179	17.6	17.7	17.4	16.8
Banking, Insurance	2,721	3,821	5,258	7,037	3.6	3.6	3.6	3.6
Housing	5,514	6,881	8,551	10,645	7.3	6.5	5.8	5.4
Public sector	6,044	8,689	12,272	16,199	8.0	8.2	8.3	8.2
Services	3,733	4,526	5,310	6,239	4.9	4.5	4.0	3.2
TOTAL	75,545	105,960	145,948	197,026	100.0	100.0	100.0	100.0
Main sectors :								
- Primary					28.8	27.4	25.8	24.0
- Secondary					29.8	32.3	35.3	38.8
- Tertiary					41.4	40.3	38.9	37.2

Table 3-08

BREAKDOWN OF GDP BY ECONOMIC SECTOR, IN PERU AND OTHER COUNTRIES

(Percentages)

Economic Sector	Peru		Colombia	Chile	Argentine	United States	France	Italy	Spain
	1964	1980 (b)	1960	1960	1961	1961	1962	1962	1960
Agriculture (a)	21.4	17.4	34.6	13.8	20.2	4.2	9.2	16.8	26.7
Mining industries	7.6	6.6	4.0	4.5	1.3	1.2	1.8	0.9	2.0
Manufacturing industries	19.6	25.2	17.0	20.1	21.8	28.9	37.1	32.1	23.9
Construction	4.1	6.4	3.7	3.0	4.7	5.2	6.7	7.8	4.4
Power	0.4	0.8	0.9	0.8	1.2	2.2	1.7	2.8	2.4
Transport	5.3	6.4	6.4	4.5	9.8	6.2	5.2	6.9	6.7
Commerce	17.6	16.8	12.7	22.8	17.0	16.5	13.5	8.9	9.3
Banking, insurance	3.7	3.6	2.6	2.7	2.1	8.7	0.9	3.7	4.1
Housing	7.4	5.4	5.3	7.6	2.9	2.1	3.7	5.5	4.7
Public sector	7.8	8.2	5.6	7.7	12.0	13.7	8.8	10.9	5.8
Services	5.1	3.2	7.3	12.3	6.9	10.6	11.4	3.7	10.0
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

NOTES : (a) Includes Fisheries.
(b) Forecast.

SOURCES : For Peru (1964): Estimates of the National Planning Institute; for Colombia, Chile, Argentina and the United States: Pan american-Union, "America en Cifras 1963", Table N° 342-03; for France, Italy and Spain: OECD, Statistics of National Accounts, April 1964, Supplement.

3.4.1. Population trends

The population of Peru is now increasing at a rate of 3.1 per cent per annum, one of the highest rates in Latin America, or in the world.

This growth rate raises difficult problems for social economic development, for, however important population growth trends may be for Peru in the future, they cannot affect the labour supply in the planning period covered by this Report, for the age-group concerned is already born. Only sociological and cultural phenomena, plus measures in both public and private sectors to increase the activity rates can materially influence the total volume of supply for development purposes.

According to the 1961 National Census the population of Peru was 9.9 millions. Forecasts based on revisions of the basic data indicate a population of 13.6 millions in 1970 and of 18.5 millions in 1980. The 15-64 age-group, which provides the bulk of the economically active population, represented 52.9 per cent of the total population in 1961, i.e. 5.2 millions; this proportion will gradually increase to attain 53.5 per cent, or 9.9 millions, in 1980.

3.4.2. The labour force and its economic contribution in 1961

The labour force in Peru numbered 3.1 millions in 1961, of whom approximately 78 per cent were males. In addition, 217,000 workers, or 7 per cent of the active population, were either under 15 or over 65 years of age. Other interesting features of the Peruvian activity rates and the nature of the existing labour force may be shown by means of a comparison with data for other countries.

Table N° 3-09

STANDARD ACTIVITY RATES(1) FOR MEN AND WOMEN IN SELECTED COUNTRIES (1961)

(Percentages)

	TOTAL	MEN	WOMEN
Peru	60	95	26
Chile(2)	57	92	24
Italy	59	87	32
Spain(2)	58	98	21
Canada	57	81	32
United States	61	82	41
Austria	73	92	56
United Kingdom	71	95	48

(1) Ratio between the total active population and the 15-64 age-group.

(2) 1960.

SOURCES: Peru: 1961 Census; Chile: United Nations, "Boletín Estadístico de América Latina" (1964); other countries: OECD "Manpower Statistics 1950-1962" (1963).

At first sight the overall activity rate in Peru seems to lie within normal limits as compared with other countries. The very high rates noted in such countries as Austria and the United Kingdom are explained mainly by the high female activity rate. There are, however, other factors, and for two or possibly three reasons too much importance should not be attached to the apparently normal rate in Peru. The method used in computing the standard activity rates (dividing the gainfully occupied population by the total population between the ages of 15 and 64) may give a false picture for those countries whose populations have a different age-structure. Although the Peruvian activity rates seem normal in comparison with those of other countries, there is an unusually high proportion of young people whose participation in production is nevertheless very limited. The under-15 age-group represent 43 per cent of total population. Table N° 3-10 not only brings out the very real importance of this proportion, but also shows that to calculate the rate of activity expressed simply by the ratio between active and total population - and not the 15-64 age-group - would give a more exact idea of the situation in Peru in relation to that of other countries.

Table N° 3-10

ACTIVITY RATES, AND PERCENTAGES OF THE TOTAL POPULATION UNDER 15, IN SELECTED COUNTRIES (1961)

	Activity rate	Population under 15
Peru	32	43
Italy	41	25
France	40	26
Spain(1)	38	27
Portugal(1)	38	29
United States	39	31
Netherlands	37	30
Austria	48	23

(1) 1960.

SOURCES: As for Table 3-09.

For somewhat different reasons the activity rate may be artificially inflated when calculated in the normal manner for a country with a high employment rate for persons below and above the 15-64 age-group. An effective comparison of activity rates should consider the real efficacity of the Acts on the employment of minors, the scope of their application, their effects on educational cycles and on superannuation and social insurance systems, all of which tend to reduce the proportion of those employed outside the 15-64 age-group.

Partial employment (or under-employment) is estimated to be fairly high in Peru. The methods used for sharing the available work and distributing the surplus of labour among certain sectors add to the problem. Under-employment in Peru is acute in agriculture, the services sector and commerce, while the tendency to use the casual and unpaid labour of family members in these sectors also increases the difficulties. In this connection, much of future research should be broken down so as to distinguish the more modern part of the agricultural sector from the traditional subsistence-type.

The foregoing tables bring out one more aspect, i.e. the activity rate for women. While the proportion of employed women in Peru is greater than in other countries with a similar cultural background it is still very small, there being only one employed woman for every 3.6 men. Since many of these women are in agriculture, and on seasonal work, the real proportion is even smaller. The comparative ratios for Italy, Canada and the United States are 1:2.6, 1:2.6 and 1:2.0 respectively. If Peru could attain the same ratio as Italy, for example, its total labour force would increase by 9 per cent.

3.4.3. Estimates of total future employment and activity rates

Forecasts of total employment and the activity rates for men and women reflect the various points mentioned above. Total employment is expected to increase more rapidly than population (3.3 per cent against 3.1 per cent) to reach a total employment figure of 5.8 millions(1) in 1980. This increase means that an average of 142,000 more people will be employed each year. The employment rate for women is expected to increase at the rate of 4.4 per cent per annum, and for men at the rate of 3 per cent. Of the active population, 64 per cent will be men and 36 per cent women, and the ratio of men to women will be 1.8:1, compared with 3.6:1 in 1961.

A comparison was attempted between the 1940 and 1960 Census figures to find the trend of the female activity rate. Unfortunately, the definition of a gainfully employed women varies so much from one census to the other that such a comparison would be meaningless. Nevertheless, there are several reasons for believing that the female activity rate has increased. One of the main effects of industrialisation in other countries has always been a substantial increase in the employment of women. Qualified observers point out that the female activity rate in Peru has increased very rapidly in recent years. In addition, the views of informed anthropologists and sociologists on the social and cultural changes now taking place

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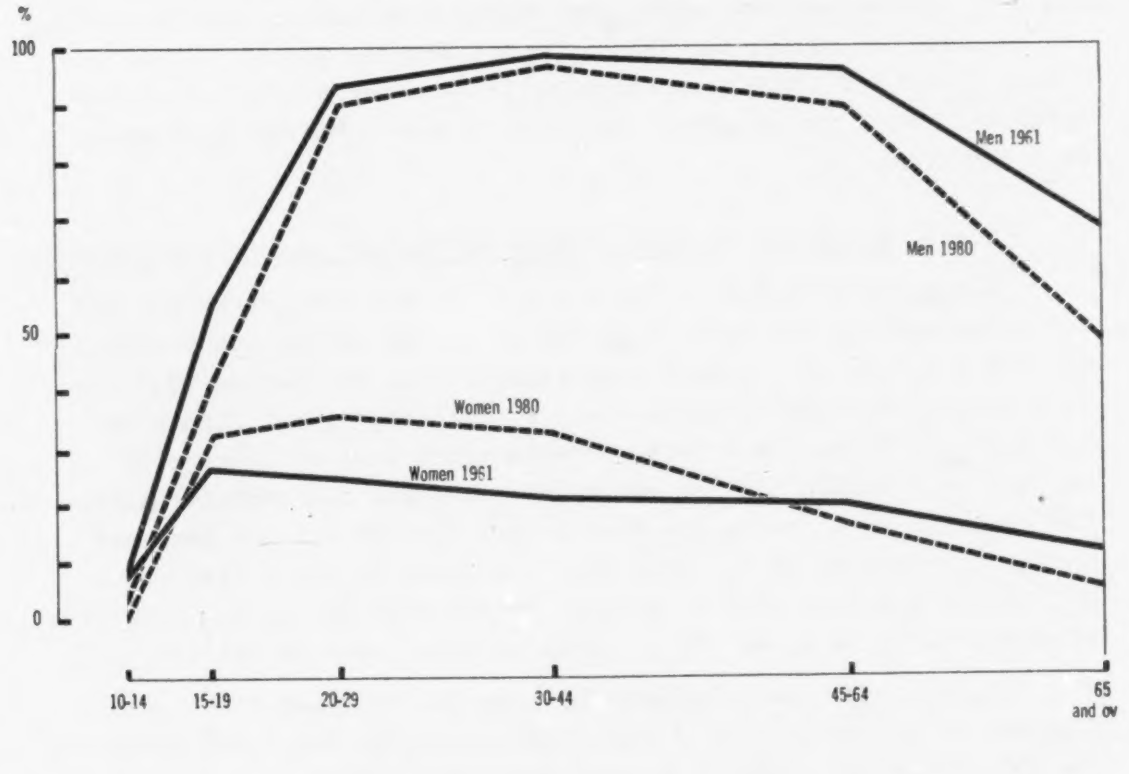
(1) See explanatory note to Table N° 3-11.

Diagram 3-05

ACTIVITY RATE, BY SEX AND AGE-GROUP, 1961 AND 1980



in Peru show that the process of urbanisation, which tends to speed up the changes in the cultural patterns and population values, will give rise to an even higher rate of female activity. Lastly, data available for other, especially the developing countries, show the same trend in recent years. In Italy the female activity rate rose from 27 per cent in 1955 to 32.4 per cent in 1961; in Spain, from 17 per cent in 1950 to 21 percent in 1960, and in Austria from 50 per cent in 1951 to 56 per cent in 1961.

The substantial increase in female employment and in the activity rates for certain categories in the 15-64 age-group is partly offset by a fall in the activity rate for men, especially for young men about 15, and by a fall in the activity rates for both sexes in the under 15 and over 64 age-groups. As educational opportunities and the average time spent in school increase, the activity rate for males in the 15-29 age-group will fall fairly sharply. Early superannuation and the extension of compulsory primary education for both sexes will cause a reduction in the activity rates for all persons over 65 and under 15. Table Nº 3-11 shows these forecasts and the relative activity rates.

EXPLANATORY NOTE: Total and active population figures for 1961 refer to the uncorrected census figures. The forecasts of total population were made by the National Directorate of Statistics and Censuses on the basis of revised census figures, while the manpower forecasts in this Report were made on the basis of the uncorrected figures, which were the only available source.

3.5. Productivity estimates and breakdown of employment by sector

As shown in the section on the sector growth rates of GDP, economic development generally means the transfer of workers from agriculture to industry. This process, especially in view of the rapid increase in population, must be accompanied by improved productivity in agriculture through the introduction of modern techniques, the reorganisation of production units and the marketing of produce. In 1961, half of Peru's labour force was employed in agriculture, with a very low average level of production per worker as compared with other economic sectors. The fact that it has not been possible to break down agriculture into such elements as family and part-time employment should be borne in mind when interpreting the productivity level in agriculture.

Table 3-11

PERU - ACTIVE POPULATION AND ACTIVITY RATES, 1961 AND 1980 (FORECAST)

(In thousands of persons)

	TOTAL	10-14	15-19	20-29	30-44	45-64	65 et plus	Age unknown	"Normal" rate (Ratio between the active population and population between 15 and 64 years)	Activity rate (Ratio between the active population 15 to 64 years and the total population 15 to 64 years)
1961										
Total population	9,906.7	1,152.2	973.7	1,589.5	1,580.3	1,092.9	375.3	5.0		
Men	4,925.5	594.7	494.0	780.4	781.2	529.2	164.6	2.5		
Women	4,981.2	557.5	479.7	809.1	799.1	563.8	210.7	2.5		
Active population (a)	3,124.6	79.6	401.2	942.6	937.2	623.8	138.1	2.0		
Men	2,445.4	41.1	271.1	736.1	771.4	511.0	113.1	1.6		
Women	679.2	38.5	130.2	206.5	165.8	112.7	25.0	0.5		
Activity rate	31.5	6.9	41.2	59.3	59.3	57.1	36.8		59.7	55.5
Men	49.7	6.9	54.9	94.3	98.8	96.6	68.7		94.6	88.6
Women	13.6	6.9	27.1	25.5	20.8	20.0	11.9		25.6	23.2
1980										
Total population	18,527.0	2,297.4	1,987.3	3,051.6	2,865.6	1,974.8	599.9			
Men	9,338.0	1,164.8	1,005.7	1,542.1	1,444.3	978.9	276.1			
Women	9,189.0	1,132.6	981.6	1,509.5	1,421.3	995.9	323.8			
Active population	5,824.7	57.5	736.2	1,944.4	1,873.9	1,005.2	157.5			
Men	4,287.1	34.9	412.3	1,401.0	1,410.0	890.8	138.1			
Women	1,537.6	22.6	323.9	543.4	463.9	164.4	19.4			
Activity rate	31.0	2.5	37.0	64.0	65.0	53.0	26.0		59.0	56.8
Men	46.0	3.0	41.0	91.0	98.0	91.0	50.0		86.0	82.8
Women	17.0	2.0	33.0	36.0	33.0	17.0	6.0		31.0	30.5

(a) Includes workers under 10 years of age.

SOURCES: 1. Sixth National Census - first priority results.
2. Boletín de Análisis Demográfico, November 1964.

Note: The showing data total population and active population in 1961 relate to unrevised Census data. The forecasts for total population have been carried out by the National Directorate for Statistics and Census, from the revised data Census; whereas manpower forecasts have been established with a view to the present Report, on the basis of the only existing unrevised data.

In Peru, apart from the general transfer of workers to other sectors, a number of other factors influence policy for agricultural and industrial expansion. These include the low nutritional level of a large part of the population, the high birth rate and the fact that Peru is a net importer of food products. Agricultural reform and reorganisation, combined with the land settlement projects, irrigation works and agricultural extension services are important elements in the government's programme to increase production and attain its social objectives.

Large-scale migration from rural areas to the urban centres and the emergence of the crowded "shanty towns" due to the shortage of low-rent houses and the few opportunities of finding employment are closely related phenomena in most of Latin America, and Peru is no exception. The problem is a dual one of creating new jobs in the non-agricultural sector to absorb the migrants and the natural increase in the labour force (which is very rapid), and of providing a sufficient range of employment opportunities in rural areas to reduce temporarily the enormous flow of emigrants.

The distribution of the labour force among the various economic sectors depends on the growth rate of production in each sector but also on the changes in the level of productivity. The 7 per cent growth rate adopted in this Report which, in reality, is the desirable minimum for Peru in view of its high birth rate, fixes the increase in total productivity.

This, then, is one of the key factors governing Peru's employment policy. When the population increases very rapidly the pressure exerted by the supply of manpower is very heavy. If jobs are to be provided for all who enter its labour market the level of productivity cannot be expected to show the spectacular increase usually found in the plans of countries where the birth rate is lower. Hence, with an average productivity growth rate of 6.4 per cent and a more or less stable activity rate, forecasts show an overall growth rate of 3.0 per cent per annum for productivity.

The foregoing paragraphs have dealt with the general nature of the movement from agriculture-to-industry and from country-to-town and the overall limits of productivity if employment opportunities are available. A more detailed analysis will now be made of the many factors which decide the overall distribution of employment among the different aconomic sectors.

Diagram 3-06

MANPOWER FORECASTS BY ECONOMIC SECTOR

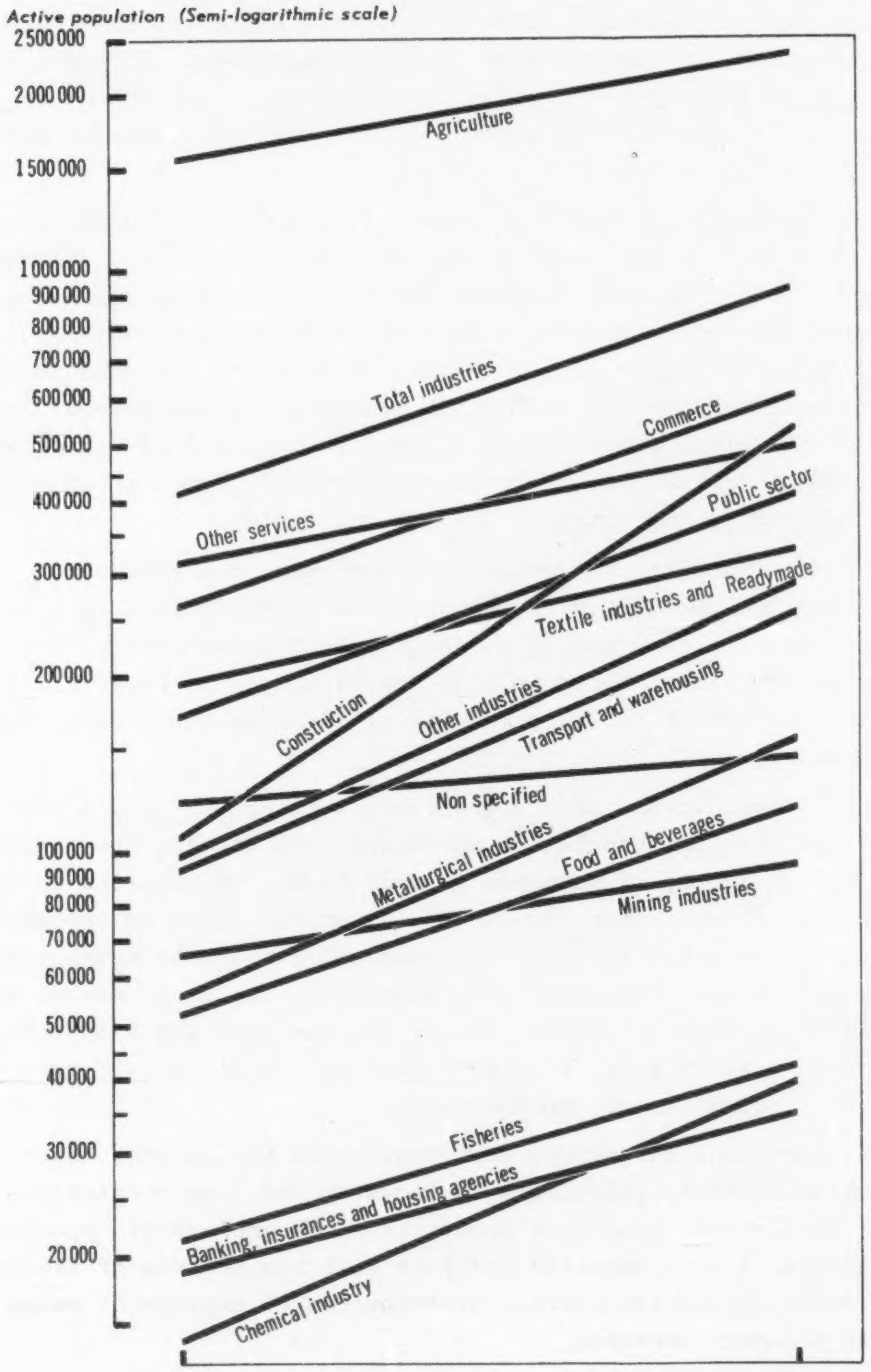


Diagram 3-07

BREAKDOWN OF MANPOWER BY ECONOMIC SECTOR, 1961-1980

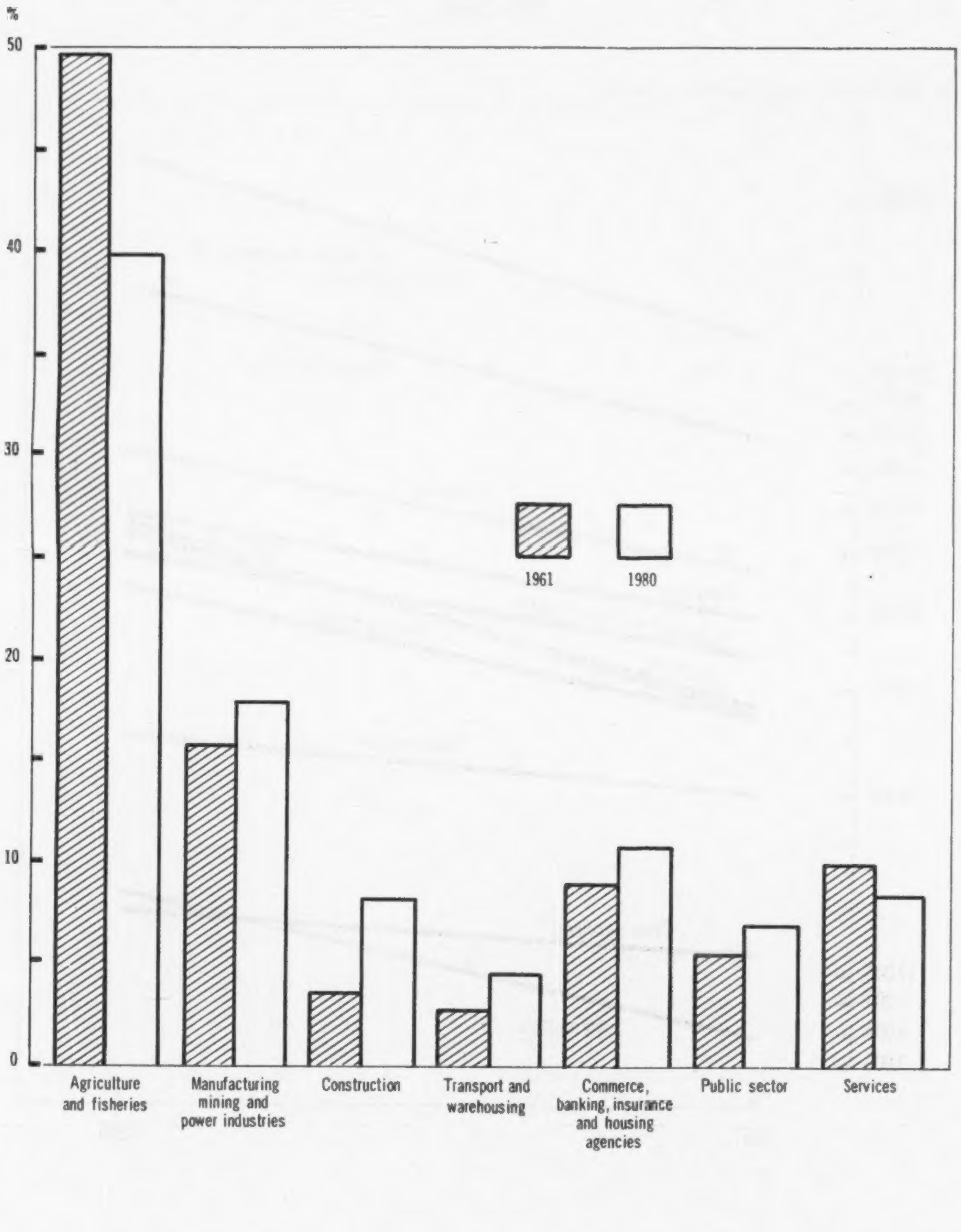
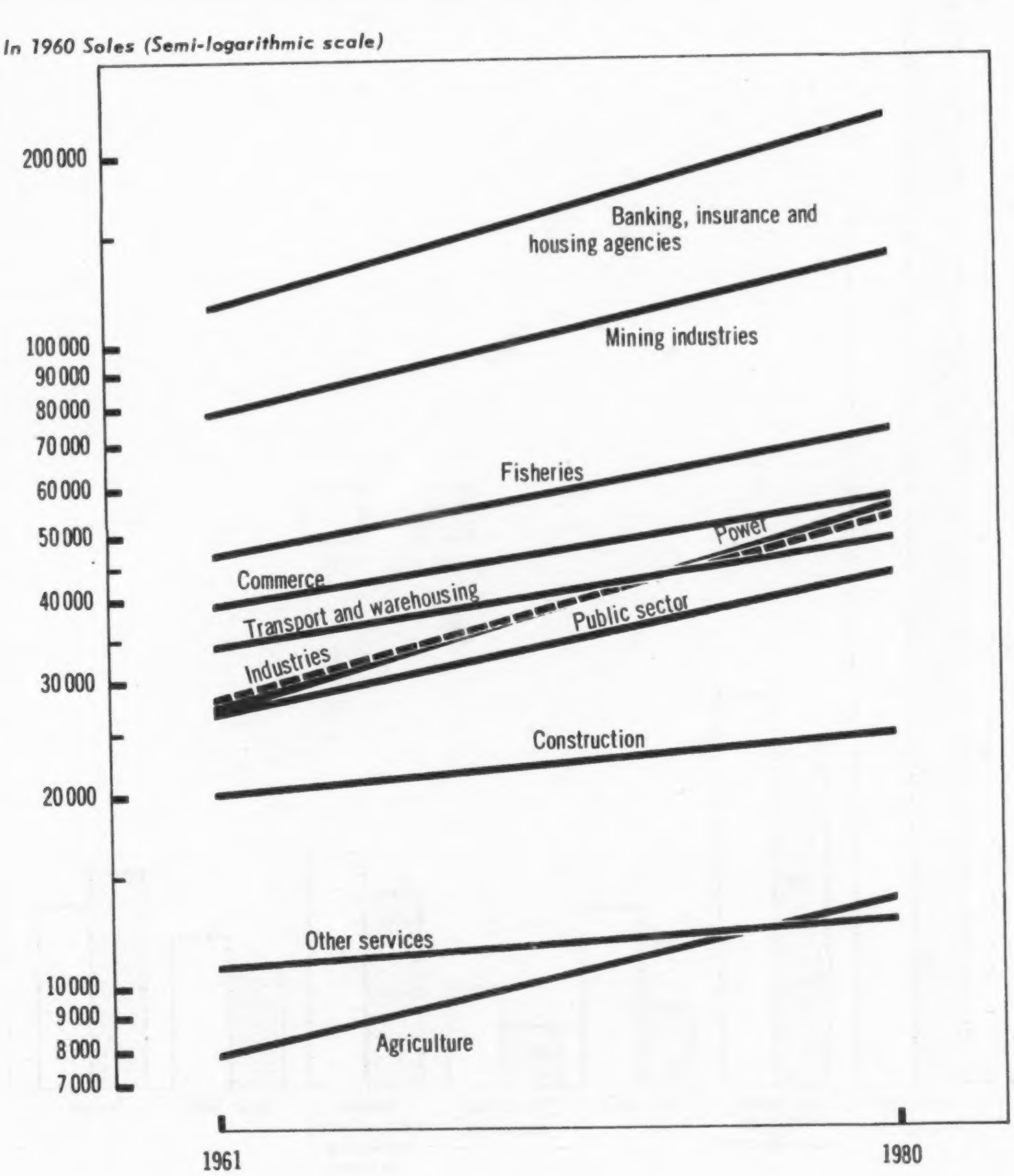


Diagram 3-08

PRODUCTIVITY TRENDS, BY WORKER AND ECONOMIC SECTOR
1961-1980



3.5.1. Bases for estimating productivity

An initial attempt was made to discover the productivity trends for certain sectors over recent years, but unfortunately no earlier reliable general data exist on the subject. The productivity growth rates for individual sectors were therefore calculated on the basis of targets fixed in view of the obvious need to raise the level of certain sectors; certain measures to achieve a more functional productivity relationship between the sectors; research at sector level (including tacit public policy measures); the use of international comparisons to identify the trends and level of productivity in various economic sectors; capital intensity; sectors and sub-sectors which seem most likely to attract private investments; recommendations likely to encourage investment and employment policy; empirical data on growth coefficients comparable with those for other countries - for sub-sectors of the manufacturing industry, and the use of highly significant data resulting from an original survey based on unpublished data in the First Economic Census of 1963 concerning 243 manufacturing establishments.

Empirical data on productivity trends are obviously very useful for estimating future trends, but their chief value lies in the fact that they can be used to check forecasts. Their disadvantage lies in their tendency to be guided too rigidly by earlier results. It would have been useful to have data on trends, but their absence has not made itself felt in the present context for two reasons. The technological discontinuity and lack of integration in many sectors and sub-sectors of the Peruvian economy will mean fairly abrupt changes if future development targets are to be attained and, secondly, the adoption of explicit development policies has given a degree of dynamism to the bases used for estimates, which is an improvement on other more conventional techniques.

Table N° 3-12 summarises the results of the calculations based on the productivity hypotheses, employment forecasts by economic sector, the absolute productivity levels and the distribution of employment in both the base and target years of the forecast. We shall now attempt a more detailed account of how all these various factors have been taken into consideration.

Table 3-12

FORECAST OF EMPLOYMENT BY ECONOMIC SECTOR IN 1980

Economic sectors	Employment 1961 (in thousands)	GDP 1961 (millions of 1960 Soles)	Product per worker 1961 (thousands of 1960 Soles)	Annual growth rate of productivity 1961 - 80 (%)	Product per worker index 1961-80	Product per worker 1980 (thousands of 1960 Soles)	GDP 1980 (millions of 1960 Soles)	Employment 1980 (in thousands)	Change of job index 1961 - 80	Annual employment growth rate (%) 1961 - 1980	Breakdown of employment	
											1961	1980
Agriculture	1,534.1	12,313.2	8.03	2.7	167	13.43	31,032	2,311.5	151	2.2	49.2	39.7
Fisheries	21.1	1,010.6	47.90	2.3	153	73.48	3,123	42.5	201	3.8	0.7	0.7
Mining	66.3	5,221.8	78.76	3.0	176	139.11	13,076	94.0	142	1.9	2.1	1.6
Manufacturing industries	410.9	11,513.5	28.02	3.5	194	54.27	49,476	911.7	222	4.3	13.2	15.7
Construction	104.7	2,086.2	19.93	1.1	124	24.72	12,686	513.1	490	8.7	3.4	8.8
Power	8.6	235.3(a)	27.36	3.8	205	56.05	1,648	29.4	342	6.7	0.3	0.5
Transport	93.9	3,193.0	34.00	2.0	147	49.98	12,686	253.8	270	5.4	3.0	4.4
Commerce	263.0	10,449.2	39.73	1.8	141	56.21	33,179	590.3	224	4.3	8.4	10.1
Banking and insurance	18.8	2,214.5	117.79	3.5	192	226.39	7,037	35.5	189	3.4	0.6	0.6
Food products	-	4,626.5	-	-	-	-	10,645	-	-	-	-	-
Public services (b)	171.8	4,642.8	27.02	2.1	149	40.42	16,199	400.8	233	4.6	5.5	6.9
Other services	304.9	3,275.1	10.74	0.8	117	12.60	6,239	495.0	162	2.6	9.8	8.5
Not specified (c)	123.0	-	-	-	-	-	-	147.1	-	-	3.9	2.5
Total	3,120.8(d)	60,781.7	18.73	3.0	1,753	32.83	197,026	5.824.7	187	3.3	100.0	100.0

(a) Estimate.

(b) Personnel employed in education (65,900 in 1961) has been split up into Government Service (56,190 in 1961) and Other Services (9,800 in 1961).

(c) Includes unemployed (40,100), trainees, and workers who did not specify their activity sector.

(d) The small difference in the total is due to rounding.

3.5.2. Sector productivity levels

Table N° 3-13 contains some very significant data on sector productivity levels (shown as indices, total productivity being 100) for five Latin American countries. While all the sectors are not strictly comparable because of international differences in the definitions, a certain pattern of productivity levels is fairly apparent.

Table N° 3-13

PRODUCTIVITY INDICES BY ECONOMIC SECTOR IN CERTAIN LATIN AMERICAN COUNTRIES

ECONOMIC SECTOR	Peru (1961)	Mexico (1960)	Venezuela (1961)	Argentina (1960)	Chile (1960)
Agriculture	41	35	21	116(c)	44
Fisheries	246	-	-	-	-
Mining industries	404	429(b)	1,596	189	106
Manufacturing industries	144	168	91	85(d)	109
Construction	102	97	77	78	41
Power	-	331	146	107	-
Transport	174	155	87	159	143
Banking, Insurance	604	-	-	-	-
Commerce	204	272	115	146	211
Services	113(a)	129	113	198	142(a)
Public sector	206	-	-	-	-
Total	100	100	100	100	100

(a) Including power
(b) Including petroleum
(c) Excluding forestry
(d) Including forestry

Except in one country, the productivity level in agriculture was less than half the average for the economy as a whole. Argentina, whose agriculture presents special features, has a productivity index in this sector greater than the overall average. In almost all the other Latin American countries the peasants are engaged in subsistence farming, using very backward methods and with very low production per worker. At any rate, attention should once more be drawn to the fact that, in view of the labour surplus and casual employment, data should be collected for the agricultural sector and broken down so as to make it possible to calculate a figure or, better still, a series of figures permitting an intensive study of a structure which, in fact, groups several agricultural sub-sectors. In several Latin American countries the productivity level in certain agricultural activities is very high compared with the traditional sector, but these activities mainly concern exportable produce.

Generally speaking, productivity in the extraction industries is fairly high in relation to the average, but, as in certain branches of agriculture, the products are for export; advanced methods are frequent and are possible mainly due to the intensive use of foreign capital. Table N° 3-13 particularly brings out in Venezuela the influence of petroleum on productivity in the extractive industries. This sector contributes more than 30 per cent of the gross national product, and so has a very pronounced influence on the productivity average for the whole Venezuelan economy.

This table also brings out the high productivity level in the commercial sector, where it is above average in all the countries and more than double in three. In Peru, productivity for banking and insurance is also five times the average, whereas building is conspicuous by its relative backwardness. In all the countries considered, this is one of the sectors where productivity is lowest.

Manufacturing seems to be comparatively under-developed; the table shows that the productivity level in this sector is below the average in two countries and only a little above in another. Mexico and Peru show the highest productivity indices in manufacturing, but even in these two countries other sectors have a much higher level. Since manufacturing is one of the most important sectors in a country which intends to develop, and present productivity levels are a good indication of the development of this sector, attention should be drawn to other vitally important factors to be examined in greater detail later. Manufacturing sub-sectors show considerable variation in all countries, and particularly in Peru, so that the productivity hypotheses for the various sub-sectors will be examined separately elsewhere in this Report.

The distribution of employment among the four main economic sectors for the five countries included in Table N° 3-13 is given in Table N° 3-14, which shows that the sectors of relatively high productivity to which we have referred, i.e. extraction and commerce, provide only a small proportion of the total employment in these countries. The contribution of these two sectors varies between 10.5 per cent for Peru to 14.6 per cent for Venezuela. On the other hand, in Mexico and Peru, agriculture and manufacturing provide more than 60 per cent of all employment, and in the other countries listed more than 40 per cent.

Table N° 3-14

BREAKDOWN OF EMPLOYMENT BY THE FOUR MAIN ECONOMIC SECTORS IN SELECTED COUNTRIES

ECONOMIC SECTOR	Peru (1961)	Mexico (1960)	Venezuela (1961)	Argentina (1960)	Chile (1960)
Agriculture	49.2	54.2	32.2	19.2	27.5
Mining	2.1	1.3	2.0	0.5	4.1
Manufacturing	13.2	13.7	12.3	25.2	17.2
Commerce	8.4	9.5	12.6	11.9	9.5
% of all Employment	72.9	78.7	59.1	56.8	58.3

SOURCES: Peru: 1961 Census; Other countries: United Nations, "Boletín Estadístico de América Latina" (1964).

Obviously there must be a new employment structure and the productivity levels of the different economic sectors must be brought more into line. Manufacturing, where productivity is normally high in the more developed countries, requires considerable investment in capital and in better-skilled human resources, and will absorb a progressively larger share of the active population. Productivity in agriculture must improve fast enough to meet the needs of an expanding population, at the same time as agricultural workers will be moving to other sectors. Productivity in the extractive industries is expected to keep up its present growth rate thanks mainly to the modern techniques of intensive capitalisation adopted by the foreign companies. Productivity in the commercial sector will continue to improve, although probably the rate will be slower than the average, since standards are already high and the commercial establishments outside the coastal zone have to be developed.

3.5.3. Sector plans and employment policy

Peru is now giving priority to the development of certain sectors of its economy, with the threefold objective of: reducing the enormous disparities in the development of the country's three main geographical regions (coastal, mountain and forest); opening up commercial and transport networks; stimulating the development of widely scattered industries. Various construction projects have been undertaken: irrigation works, roads and highways, electricity power plants to supply the new industries, and factories to encourage industrial expansion. Houses must also be built in both rural and urban areas. Approximately 76 per cent of all public investment for 1965-66 directly concerns construction; this tendency which ought to become active policy, could serve as the basis for a programme of public investment to ensure as large a number of jobs as possible in building. Such a policy would to some extent help relieve one of the most difficult problems in planning human resources, that of unemployment.

The expansion of transport and communications, power and construction implied in the public investment programmes is reflected in two ways in the employment forecasts: by the high growth rate for production in these three sectors, and by their higher-than-average rate of expansion for employment. Transport and construction could serve to provide transitional employment between agriculture and manufacturing, which is why the employment forecasts show an increase for these two sectors, which will provide 13.2 per cent of all employment by 1980, compared with 6.4 per cent in 1961. The use of migrant labour, whether semi or unskilled, would both provide employment and be a means of accelerating the expansion of these important sectors. For purposes of our analysis, this trend would mean that productivity would increase more slowly than in other sectors.

The increase in power consumption, a natural consequence of improved transport and communications, and of industrial, housing and social service development, requires the rapid expansion of what is at present a relatively under-developed sector. Employment will increase more rapidly than the economy as a whole but, in view of the size of the investments and the capital intensity required for power production, a higher productivity growth rate might be expected, amounting to 3.8 per cent per annum.

Plans for the agricultural sector foresee improvements in production techniques, and land settlement and irrigation programmes to improve productivity. They also allow for the transfer of agricultural workers to the industrialised sectors. While the growth rate for productivity in agriculture is forecast at 2.7 per cent per annum, the proportion of all employment provided by agriculture will fall from 49.2 per cent in 1961 to 39.7 per cent in 1980.

The measures taken to stimulate investment and industrial expansion will influence productivity in the manufacturing sector, which will be stimulated by the intensive use of new machines and equipment, the introduction of modern methods from abroad and the improvement in the skills of industrial workers. This sector, whose share of all employment will rise from 13.2 per cent in 1961 to 15.7 per cent in 1980, will take half a million more workers during the period under review. Such an expansion will require the setting up of many new plants and the complete overhaul of others.

3.5.4. Other factors

Productivity trends in the services sector were calculated on the basis of comparative international data for countries at similar stages of development, taking into account the sector's characteristics in Peru. Services may be regarded as a residual sector in the same way as small-scale trade. Where jobs are in short supply, income is unevenly distributed, vocational training is inadequate and a reserve of manpower is created which falls back on domestic and other personal services. The existence of a large number of domestic employees, combined with the abundance of labour available for personal services of all kinds, tends to keep the level of productivity very low in this sector; in 1961 it barely exceeded that of agriculture.

Foreign investments are considerable in such sectors as banking, mining and petroleum, automobile assembly and other industrial activities requiring large-scale initial investment, a high volume of production and a complex, modern technology. These characteristics are reflected in the productivity levels which are already comparatively high in these branches. It is hoped that these branches will continue to attract foreign investors and that productivity will be able to increase without direct State intervention, so that other sectors can benefit from any help the government has to offer.

The breakdown of employment among the various sectors, and the changes anticipated in the percentage contributed by each sector to the total product, have been indicated above either implicitly or explicitly. The changes in the employment breakdown forecast for Peru should now be compared with those for other countries. Table N° 3-15 gives a breakdown by sector of employment for a given year in a number of countries, including some in Latin America, while Table N° 3-16 gives information concerning changes that have occurred in a few countries and compares them with the forecasts for Peru.

3.5.5. Manufacturing industries

In view of the paramount importance of the part this sector plays in the process of industrialisation, and the great variety of the factors to be considered in its different sub-sectors, a more detailed analysis is considered advisable. Productivity in some of the sub-sectors is relatively more developed than in others; the degree of capitalisation varies, so that there are substantial differences in the occupational structures. This more detailed analysis was made possible by the availability of data on the utilisation of capital (unfortunately not available for other sectors), by econometric research into various aspects of the manufacturing industry, and by the use of unpublished data from the First Economic Census of 1963. The latter have provided a very up-to-date source for studying the occupational structure by sub-sector.

A problem arises in industrial productivity, however, which we have not been able to examine properly; it concerns a certain amount of dualism in the various sectors. The 1963 economic census of registered industrial firms shows 193,000 persons in manufacturing industries, whereas the 1961 population census, which also includes artisans, shows 411,000. The productivity of these two groups and their contribution to the national product appear to vary considerably, so that the planning services should make a detailed breakdown in order to make a better estimate of the manpower distribution for this strategic sector. In any case, textiles and ready-made clothing is the most vulnerable of the sub-sectors.

Table 3-15

BREAKDOWN OF ACTIVE POPULATION, BY ECONOMIC SECTOR (In percentages)

ECONOMIC SECTOR	Peru 1951	Argentine 1960	Brazil 1950	Colombia 1951	Chile 1960 (a)	Mexico 1960	Venezuela 1961 (b)	Canada 1961
Agriculture	49.8	19.2	59.6	53.9	27.5	54.2	32.1	12.1
Mining industries	2.1	0.5	0.7	1.6	4.1	1.3	1.9	1.9
Construction	3.4	5.6	3.4	3.5	7.0	3.5	5.3	6.7
Manufacturing industries	13.2	25.2	9.4	12.3	17.2	13.7	12.3	21.7
Power	0.3	1.2	0.7	0.3	.... c/	0.4	1.1	1.1
Commerce	8.4 d/	11.9	6.3	5.4	9.6	9.5	12.6	18.9
Transport	3.0	6.3	4.0	3.5	5.1	3.2	4.4	8.2
Services	15.9	20.0	15.7	15.9	24.1	13.5	23.8	27.0
Not specified	3.9 e/	10.1	0.2	3.6	5.4	0.7	6.4 f/	2.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

(a) One per cent sample of homes in census.

(b) Four per cent for Caracas and one per cent for rest of country.

(c) Included in services.

(d) Except banking shown under services.

(e) Including unemployed.

(f) Includes 0.9 % of persons seeking employment.

Sources : Canada, OECD "Manpower statistics 1950-1962", same source as for table 3-14.

Table 3-16

CHANGES IN THE BREAKDOWN OF EMPLOYMENT, BY ECONOMIC SECTOR, IN SELECTED COUNTRIES (Percentages)

ECONOMIC SECTOR	PERU		PORTUGAL		SPAIN		TURKEY		UNITED STATES	
	1961	1980 b/	1950	1960	1950	1960	1955	1960	1950	1960
Agriculture	49.8	40.4	42.2	36.5	36.5	27.6	77.4	74.9	13.5	9.3
Mining industries	2.1	1.6	1.0	1.0	2.5	2.6	0.5	0.6	1.6	1.1
Manufacturing industries	13.2	15.7	21.3	24.4	22.9	29.9	5.9	6.8	25.8	25.0
Construction	3.4	8.8	6.5	9.0	7.1	7.5	1.6	2.2	5.8	6.3
Power	0.3	0.5	0.4	0.6	0.8	0.8	0.1	0.1	0.9	0.9
Commerce	8.4 a/	10.1	5.4	6.8	5.3	5.5	2.8	3.1	22.9	24.8
Transport	3.0	4.4	4.4	4.8	5.6	5.5	1.6	1.9	6.1	5.2
Services	15.9	16.0	18.7	16.8	17.7	20.6	4.1	5.2	23.5	27.4
Others not specified	3.9 c/	2.5 c/	0.1	0.2	1.5	-	6.0	5.1	-	-
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

The absolute levels of productivity vary considerably from one sub-sector to another (see Table N° 3-17). Productivity in chemical products, and in food and beverages, is relatively high, whereas it is only 5 per cent higher in textiles than in the services sector. However, the two sub-sectors: textiles and miscellaneous manufactures (the latter includes timber and cork, paper, printed goods, furniture, cement, glass and other construction materials) cover 70 per cent of all employment in the manufacturing sector but contribute barely 36 per cent of the product. The two sub-sectors with the highest productivity - food and beverages, and chemical products - account for only 26 per cent of all employment but contribute 47 per cent of the product.

In addition, the manufacturing industry is concentrated in the neighbourhood of Lima, the capital. About 75 per cent of the registered undertakings in the manufacturing industry are situated in the Lima area, to supply the principal market for manufactured goods. The government is making a deliberate effort to improve the geographical distribution of the manufacturing industry. The construction of industrial regions, the granting of tax concessions, and a number of other measures to stimulate industrial activity in various parts of the country should have a favourable effect on development generally, but it is difficult to assess how this will affect productivity. If only the greater geographical dispersal is considered, the most likely net result will be to slow down the productivity growth rate in the sub-sectors producing building materials, foodstuffs and beverages, as compared with the rates for other sub-sectors. This is due mainly to the relatively small scale of operations and the rudimentary methods usually found in the first few years of operation, and to the shortage of managerial and technical personnel in most small urban centres.

Data derived from a sample consisting of six groups of firms in the manufacturing industry have been examined to determine trends in productivity and capital utilisation. There is a fairly clear relationship between the size of the firm and the level of productivity, the largest undertakings having the highest productivity levels up to about 400 employees. Beyond that it is apparent that, for the sector as a whole, the largest undertakings do not show the highest productivity levels.

The present level of productivity in the food and beverages sub-sector is relatively high. This sub-sector has grown rapidly

Table 3-17

PRODUCTIVITY AND EMPLOYMENT FORECASTS, BY INDUSTRIAL SUB-SECTOR, 1980

Sub-sector	Employment 1961 (thousands of persons)	GDP 1961 (millions of 1960 soles)	Product per worker 1960 (thousands of 1960 soles)	Annual growth rate for productivity (%) 1961-1980	Product per worker index 1961-1980	Product per worker 1980 (thousands of 1960 Soles	GDP 1980 (millions of 1960 Soles)	Employment 1980 (thousands of persons)	Variation in employment index 1961-1980	Variation in annual rate 1961-1980	Break-down of employ-ment 1961	1980
Food products and beverages	52.2	4,006	76.75	2.7	1,6641	127.72	14,892.3	116.6	2,2337	4.3	1.7	2.0
Textiles and ready mades	191.8	2,141.5	11.17	3.8	2,0376	22.76	7,421.4	326.1	1,7002	2.9	6.1	5.6
Chemical products	14.4	1,416.2	98.35	2.9	1,72811	169.96	6,679.3	39.3	2,7292	5.4	0.5	0.7
Metallurgy	55.7	1,934.3	34.73	4.0	2,1114	73.33	10,934.2	149.1	2,6768	5.3	1.8	2.6
Others	96.8	2,014.9	20.82	2.6	1,6345	34.03	9,548.9	280.6	2,8988	5.8	3.1	4.8
TOTAL	410.9	11,513.3	28.02	3.5	1,937	554.27	49,476.1	911.7	2,219	4.3	13.2	15.7

in recent years, to judge by Chenery's international growth coefficients for 51 countries; even for Peru alone its growth rate was above the average for the whole of the manufacturing sector in recent years. The variety and quantity of food products must be increased however, especially outside the coastal area. The expansion planned in other geographical areas however may result in a somewhat lower growth rate for productivity than if production were more concentrated. The food sub-sector, where nearly 13 per cent of all the persons employed in the manufacturing sector now work, will maintain the same percentage until 1980, while total employment will be 123 per cent higher than for the period covered by this Report.

In a number of countries, the textiles and clothing industry proved a source of early expansion in light manufactures. It may also prove useful to stimulate industry when replacing imported by domestic goods. In 1961 this sub-sector accounted for 46 per cent of all employment in the sector. Despite the sub-sector's importance as a source of employment, however, its productivity level was extremely low, being only 15 per cent of that in the food and beverages sub-sector, and only 26 per cent of the average level for the remainder of the sector. Thus the textiles and clothing branch is characterised by high production costs; its equipment is obsolete and methods have not changed for a long time. Its growth in recent years has been slower than that of the manufacturing sector as a whole due to the small amount of new investments for modernising plants and equipment. Capital intensity per worker is much lower than in any other sub-sector, being only 34 per cent of the sector average.

If this industry is to become an important source of future employment, new equipment and machinery, modern methods must be installed. Even if employment expands at a much slower rate than in other sub-sectors (2.9 per cent per annum), the textile industry will still account for 36 per cent of all employment in the sector in 1980.

The chemical industry, including petroleum by-products, employs only 3.5 per cent of the workers, while supplying 12.3 per cent of the total product of the manufacturing sector. It is the most highly developed of the sub-sectors from the point of view of yield per worker, capital intensity, recent growth and the skill level of the labour force. The chemical industry is characterised by the utilisation of large amounts of foreign capital and of foreign, highly skilled professional and technical personnel. This will soon be one of the most important "new" industries in Peru, and it is hoped that productivity, already high, will keep up the same growth rate. Employment in this sub-sector is expected to expand much more than in other sub-sectors. Even so, it will provide only 4.2 per cent of all employment in the sector in 1980.

Metallurgy, which includes basic heavy industry, vehicle assembly, electrical and non-electrical machinery, will need to expand considerably and to improve its methods, capital structure and labour productivity. At the present time, this sub-sector provides 13.6 per cent of the employment in the sector and 17 per cent of the product. Since there is likely to be a substantial expansion of basic industry, this should provide 16.3 per cent of all employment in 1980. As is usual in all developing countries, there are great differences in capital intensity and in productivity between the most modern part of this sub-sector and the small foundry-type establishments. The average level in the former is almost four-and-a-half times the average. Most of the future expansion of the product and of employment will occur in the most modern part of the sub-sector and productivity is expected to increase more rapidly here than anywhere else in manufacturing. Table Nº 3-18 shows that the productivity of the most profitable undertakings (usually the largest) was 11 times as high as that of the small undertakings.

Miscellaneous manufactures, a sub-sector which includes important industries producing such construction materials as glass, bricks and cement, is expected to show a substantial increase in employment, from 23.5 per cent of all employment in the sector in 1961 to 30.0 per cent in 1980. The employment expansion policy in the construction sector should lead to a rapid expansion of the construction materials industry. While the absolute level of productivity here is low at present, and the capital intensity per worker lower than in any other sub-sector, apart from textiles and clothing, the expansion of the construction materials industry, especially outside the Lima Metropolitan Area, means that many small local plants will probably expand. These will, of course, have limited capital, but will provide regional employment. Productivity in this sub-sector, which is higher than that in the other large sectors of the Peruvian economy, is thus expected to have the lowest growth rate of the entire manufacturing sector.

Table 3-18

BREAKDOWN OF CAPITAL AND PRODUCTIVITY INTENSITY PER WORKER IN THE MANUFACTURING INDUSTRY SUB-SECTORS, BY SIZE OF FIRMS (in thousands of current Soles)

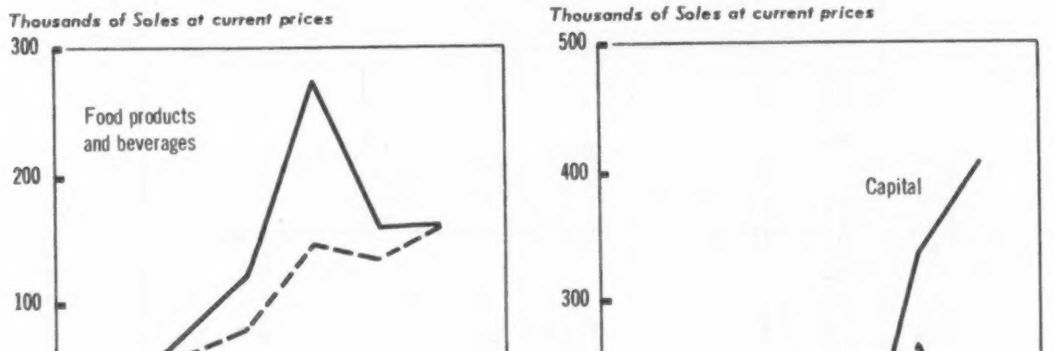
SUB-SECTORS OF MANUFACTURING INDUSTRIES	TOTAL AVERAGE	SIZE OF FIRMS (NUMBER OF WORKERS)					
		under 10	10-49	50-99	100-199	200-399	over 400
FOOD PRODUCTS AND BEVERAGES							
Capital Intensity (a)	155.3	28.8	74.9	119.9	270.4	157.9	160.1
Productivity	126.4	39.4	61.6	81.0	144.9	132.5	157.2
TEXTILES AND READY MADES							
Capital Intensity	49.4	46.1	50.0	48.4	71.4	71.4	18.3
Productivity	46.9	38.9	51.5	45.4	66.1	53.5	25.4
CHEMICAL PRODUCTS							
Capital Intensity	241.4	288.9	177.2	103.3	118.8	371.2	318.6
Productivity	140.2	118.5	132.1	129.2	116.9	154.9	162.7
METALLURGY							
Capital Intensity	195.5	34.8	46.8	50.8	148.2	339.4	414.8
Productivity	153.9	25.3	15.5	61.3	180.4	268.3	144.0
OTHERS							
Capital Intensity	84.2	28.5	40.6	84.7	81.9	98.0	143.4
Productivity	67.1	26.8	45.0	63.0	62.2	97.0	81.3
TOTAL							
Capital Intensity	144.1	38.5	60.9	85.6	157.2	214.6	177.3
Productivity	110.8	33.4	71.8	72.0	120.8	154.9	123.3

(a) Capital per worker

SOURCE : A selection of 1401 registred firms, made for 1963, by the Ministry of Industry.

Diagram 3-09

BREAKDOWN OF CAPITAL AND PRODUCTIVITY INTENSITY
IN THE MANUFACTURING INDUSTRY SUBSECTORS, BY SIZE OF FIRM, 1963



3.5.6. Summary

Forecasts of overall employment and its breakdown by sector are based on estimated future trends of the labour activity rate and of productivity growth in the various sectors and sub-sectors. The activity rates have been based on past trends, political and social targets, and the country's social and cultural progress. Productivity growth rates were calculated on the basis of a variety of factors likely to influence future trends one way or another, ranging from employment policy to international comparisons.

All productivity forecasts come up against the same difficulties - when plans are being made for a large increase in productivity at the same time as the population is expanding rapidly - of providing employment for both the newcomers to the labour force and the unemployed or under-employed.

The present ratio of capital to labour is already extremely low, and the need to expand and also intensify capital makes it very difficult for the economy to increase productivity and maintain full employment. This is why the question of human resources acquires such strategic importance in economic planning. When capital resources are limited, the economic growth rate optimistic and the labour force increasing rapidly, the limits to an increase in productivity are as obvious as a mathematical axiom. Consequently, although the productivity growth forecasts given here may seem cautious they are in fact quite optimistic compared with recent trends in other Latin American countries where economic conditions are fairly similar. Table N° 3-19 shows the productivity growth rates for the only two Latin American countries for which data are available.

Table N° 3-19

ANNUAL PRODUCTIVITY GROWTH RATES
MEXICO AND ARGENTINA

Sector	Mexico 1952-60	Argentina 1952-60
Agriculture	1.8	2.6
Extraction	1.1	7.3
Manufacturing	2.2	-1.3
Construction	0.0	-1.9
Electricity	3.9	(a)
Commerce	1.0	0.7
Transport	-0.1	
Services	0.8	0.4
Total	2.7	0.3

NOTE: (a) Electricity is included in the services sector.

SOURCES: Panamerican Union, "América en Cifras 1963" (1964);
United Nations, "Boletín Estadístico de América Latina" (1964).

3.6. Evaluation of the present manpower situation

3.6.1. General remarks

Every forecast of the future skill structure of the labour force must be based on that of today. An improvement plan must first find out the existing weaknesses and then indicate the means of overcoming them. These means are limited by the fact that the present labour force - which is slowly decreasing as a result of death, superannuation and retirement - with its rigid structure, will continue for some time to represent a considerable proportion of the total labour force. Although the importance of changing the skills of the present labour force and making it more mobile should not be under-estimated, policy for improving the future structure should concentrate mainly on the additional skilled manpower needed for replacement and expansion. For the same reason, a long-term view must be taken of human resources planning and policy.

Detailed statistical information is required to evaluate the present manpower situation, but official manpower statistics rarely permit the sort of preliminary analysis necessary for planning in this field. Special research was therefore undertaken, the results of the 1961 National Census being used as a basis.

This research took place in two stages: the most interesting characteristics of the active population were recorded on about ten magnetic tapes, and the most useful data then extracted and classified in tables. During the first stage, the data gathered were for the whole of the active population and retained their original codes (to facilitate subsequent research); for the tables, a ten per cent representative sample was used with appropriate codes. Further details concerning the sample coverage and the classifications used may be seen in the Annex to this Report.

In view of the large number of possibilities, a three-dimensional classification was chosen, in which the simultaneous interrelationship was shown of the sectors of activity, the occupational category and the educational profile. Additional factors such as sex, type of area (urban or rural) and four age-groups were introduced into this basic model.

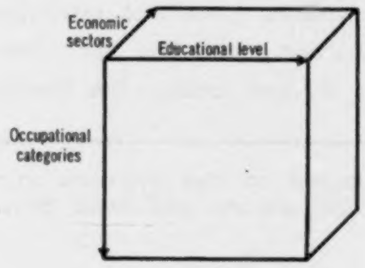
Totals and sub-totals were obtained for each series of tabulations and the IBM-1401 computer was programmed to give both absolute and relative figures. The detailed information thus produced merits a more thorough and continuous examination than is possible in the analysis in this survey.

Diagram 3-10

FIGURE SHOWING THE TRI-DIMENSIONAL MANPOWER CLASSIFICATION

Diagram 3-10

FIGURE SHOWING THE TRI-DIMENSIONAL MANPOWER CLASSIFICATION



For the economic sectors, the same classification was made as for GDP breakdowns. Manufacturing industries were broken down into the same five sub-sectors as before; education, including both public and private, was treated separately for the purpose of this analysis. Housing was excluded, since it is not possible to assign specific labour to it(1). There were 16 economic sectors, plus a heading for the "unspecified" category.

The occupational classification consists of 13 main groups or categories, broken down into 48 smaller groups, as shown in the Annex. We shall here discuss only the main groups, although the preliminary evaluations went into greater detail.

Eight educational levels were covered, although, at the lower level, both first and second cycles were considered. At the higher level the faculties were grouped together. This gave a total of 28 separate headings, which have to some extent been combined here for the purpose of the Report.

It was considered that a detailed breakdown would facilitate the evaluation of the various elements, and that the results could be submitted to experts for interpretation and assessment. Only when the degree of significance of the components is known can one judge whether, and to what extent, working with overall figures can be considered justifiable or reasonable.

According to the calculations using the 10 per cent sample of the active population, the labour force in 1961 was found to be 3,120,795 persons. This figure shows only a slight deviation (3,784) from the final results of the 1961 National Census. The difference occurs in the item "unspecified" and is due to a correction in the category of those seeking employment.

The breakdown of the labour force by economic sector will first be examined, the same classification being used as when the productivity per worker (see Table N° 3-20) was calculated.

Almost half the active population is employed in agriculture or similar types of work. Industry provides employment for only 17 per cent of the active population, and the services, chiefly commerce and personal services, 27 per cent. The Census shows the

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(1) Intermediary workers engaged on the service side of this sector belong to the "Banking, Insurance and Real Estate" category.

Table 3-20

BREAKDOWN OF ACTIVE POPULATION BY ECONOMIC SECTOR, SEX, AREA AND AGE GROUP

ECONOMIC SECTOR	Employment (In thousands of persons)	Breakdown (%)	Men (%)	Urban (%)	Breakdown by age group			
					Up to years	15-24	25-44	45 and over
Agriculture	1,534.1	49.2	85.9	17.6	2.7	26.2	41.5	29.6
Fisheries	21.1	0.7	98.7	76.2	0.8	32.1	51.0	16.0
Mining industries	66.3	2.1	97.5	44.5	0.3	27.3	57.2	15.2
Manufacturing industries	410.9	13.2	71.8	74.1	0.7	30.1	47.4	21.8
Food products	52.2	1.7	86.8	85.1	1.0	32.4	46.3	20.3
Textiles and ready mades	191.8	6.1	48.0	62.0	0.8	28.9	45.9	24.4
Chemicals and petroleum	14.4	0.5	81.2	88.4	0.2	35.5	50.8	13.5
Metallurgy	55.7	1.8	98.4	90.4	0.5	34.4	49.2	16.0
Others	96.8	3.1	94.1	80.9	0.5	28.1	49.5	22.0
Construction	104.7	3.4	99.0	82.4	0.3	25.2	53.8	20.7
Power	8.6	0.3	95.4	88.1	0.6	19.2	53.4	26.9
Transport	93.9	3.0	95.2	90.0	0.2	18.0	59.5	22.3
Commerce	263.0	8.4	71.0	85.2	0.8	25.9	48.8	24.5
Banking, insurances	18.8	0.6	82.8	97.4	0.2	20.0	62.4	17.5
Public sector	115.7	3.7	92.2	92.1	-	37.3	45.2	17.5
Education	65.9	2.1	41.8	84.6	0.2	18.2	61.4	20.3
Other services	295.1	9.5	36.5	87.3	11.3	42.6	33.0	13.2
Not specified (a)	123.0	3.9	79.7	75.4	0.8	51.3	33.5	14.5
TOTAL	3,120.8 b/	100.0	78.2	49.8	2.6	29.2	43.8	24.3

(a) Including unemployed (49.100), workers seeking employment and workers not specifying the sector in which employed.

b/ Rounded.

proportion of female labour in the active population to be slightly more than 20 per cent, although it is no doubt much higher since many women work part-time, especially in agriculture and commerce, and the census data cover only the principal occupation. Even on this basis, however, women form the majority of the labour force in personal services (65 per cent), education (58 per cent) and the textiles and clothing industries. Concealed employment makes it difficult to reach any conclusions concerning the degree of female labour in the various sectors, and it is more interesting to study the effect of female labour on the occupational structure in relation to educational qualifications.

The regional distribution of the labour force, by place of residence as shown in the Census, again bears out the imbalance between rural and urban activities. Apart from agriculture and mining, where location is determined by the availability of farming land and mineral resources, all activities are practically concentrated in the urban areas, i.e. banking and insurance almost entirely, and also building, education and public administration. Only textile manpower seems to be decentralised, and here it is probably a question of a large number of small establishments in the areas producing the raw materials. There is apparently a correlation between manpower productivity and location. The strong concentration of productive activities and facilities in urban areas permits external economies which attract new establishments, but cause a relative increase in the costs of developing activities outside these centres. The labour force too is attracted by the benefits of urban centres, which apparently offer better employment opportunities and social advancement despite the disadvantages and "costs" of mobility, the loosening of family ties, less security, and the higher cost of living in the towns. In view of these and other considerations, it is a very delicate matter, and even dangerous from the economic point of view, to attempt a geographical decentralisation of economic activities. A policy of rural development cannot be forced on the country; it should proceed step by step, and be based on a sound infrastructure in carefully selected centres of expansion. Highways construction, communications, transport and education are the "frontier" activities of rural development.

The age-composition of the labour force, by sector, though of less interest in this Report than that by occupational category, brings out some remarkable features. For example, the Census shows that more than 80,000 young persons under the age of 15 are in employment; for the same reasons as applied to female labour, this number is probably lower than the actual numbers. Most of these young persons are employed in agriculture, and also in personal services, where they constitute 11 per cent of the total employed. The highest percentage of persons over 45 is in agriculture, a fact which reflects both the effects of the exodus from this sector (which chiefly concerns young persons) and the comparatively higher retirement age of agricultural workers.

A fairly high percentage of persons in the 15-24 age-group did not specify the sector in which employed. Unfortunately, under this heading it was not possible to separate unemployed persons from those who failed to specify their employment. This general group is well above the overall average in urban areas.

3.6.2. Occupation structure by economic sector

Tables N° 3-21 and 3-22 show respectively, in absolute figures, and as percentages, the distribution of the labour force in 1961 by occupational category and sector.

The first occupational category includes such scientific and technical personnel as engineers, physicists, chemists, agronomists and veterinarians, as well as medical practitioners, dentists, and pharmacists. In 1961 they did not number more than 16,000, or only one-half of one per cent of the total labour force. A large proportion of these professional personnel are employed in personal services and are concentrated in the urban areas. For instance, for 30 medical practitioners in the urban areas there is only one in the rural areas, according to the Census definition of these areas. If the medical services are to be financed efficiently a certain degree of centralisation is necessary in the centres of population, but their distribution over the country is very uneven. In 1961 there were 2,215 inhabitants per medical practitioner for the country as a whole, but 674 for Lima and more than 30,000 in some regions. The main cause is the lack of communications and facilities, but also the fact that doctors need to live in a cultural environment which gives them the possibility of keeping up to date in their specialty. If medical services are to be expanded, special methods will have to be found, such as mobile clinics and a fuller utilisation of health officers in regions with a scattered population.

Table 3-21

BREAKDOWN OF ACTIVE POPULATION, BY ECONOMIC SECTORS AND OCCUPATIONAL CATEGORY (1961)

(in thousands of persons)

Prof. Cat. / Econom. Sec.	Scient. techn. prof.	not scien. and not techn. prof.	Intermediate	Directors managers agents	Office workers	Salesmen	Skilled workers	Semi-skilled workers	Family help	Not specified workers	Not specified categories	Military	Religion	TOTAL
Agriculture	0.85	0.35	0.55	794.00	2.85	0.25	1.55	17.90	257.85	457.35	0.55	-	-	1,534.05
Fisheries	0.03	0.05	0.19	0.21	0.25	0.03	0.09	19.67	-	0.48	0.09	0.01	-	21.07
Mining Ind.	0.93	0.43	0.86	3.20	4.00	0.38	4.33	10.89	-	40.36	0.90	0.05	-	66.31
Manuf. Ind.	1.06	1.37	2.50	8.84	12.25	4.85	65.42	204.65	0.02	104.72	5.26	0.06	0.02	410.89
Food	0.17	0.31	0.18	2.38	3.09	1.90	2.57	28.71	-	10.85	2.03	0.01	0.01	52.19
Textiles chem-	0.13	0.32	0.09	1.72	2.50	0.69	37.65	78.32	0.02	69.75	0.60	0.01	-	191.77
ical prods.	0.42	0.21	0.95	0.76	1.83	0.93	0.51	5.10	-	3.13	0.58	0.01	-	14.40
Metallurgy	0.21	0.14	0.09	1.02	1.19	0.16	9.84	36.29	-	6.24	0.54	0.01	-	55.71
Miscellaneous	0.13	0.39	1.19	2.96	3.64	1.17	14.85	56.23	-	14.75	1.51	0.02	0.01	96.82
Construction	1.73	0.13	0.54	2.19	1.19	0.06	6.00	72.01	0.01	20.39	0.40	-	-	104.65
Power	0.09	0.11	0.06	0.47	1.18	0.06	1.97	0.97	-	3.42	0.26	-	-	8.58
Transport	0.14	0.41	1.18	2.34	10.21	0.25	1.88	44.39	0.02	31.89	1.13	0.07	-	93.91
Commerce	1.01	2.56	0.47	8.81	20.35	217.09	1.14	3.34	-	6.40	1.75	0.03	-	262.95
Banking, Insu.	0.16	0.87	0.06	1.99	10.82	1.27	0.11	0.34	-	3.03	0.17	0.02	-	18.84
Publ. Serv.	1.95	3.15	2.46	4.39	21.33	0.28	1.31	5.68	-	51.61	-	23.48	0.04	115.65
Education	0.20	53.52	0.67	0.50	4.93	0.03	0.65	1.35	-	3.65	0.32	0.06	0.06	65.91
Pers. Serv.	6.71	8.19	14.31	7.59	12.25	6.38	5.96	19.71	-	210.10	1.93	0.22	1.73	295.05
Not specified	0.71	1.13	0.49	2.41	14.82	0.61	1.08	4.02	0.02	7.61	89.75	0.32	-	122.97
TOTAL	15.54	72.25	24.32	836.91	116.39	231.51	91.45	404.91	257.92	940.98	102.50	24.30	1.83	3,120.80

Table 3-22

BREAKDOWN OF ACTIVE POPULATION, BY ECONOMIC SECTOR AND OCCUPATIONAL CATEGORY (1961)

(relative figures)

Occup. Cat. / Econom. Sec.	Scient. techn. occup.	not scien. and not techn. occup.	Inter- mediate	Direc- tors mana- gers agents	Office workers	Sales- men	Skilled workers	Semi- Skilled workers	Family help	Not specified workers	Not specified categories	Milit- ary	Reli- gion	TOTAL
Agriculture	0.06	0.02	0.04	51.76	0.19	0.02	0.10	1.17	16.81	29.81	0.04	-	-	100.00
Fisheries	0.12	0.21	0.90	1.00	1.16	0.12	0.40	93.38	-	2.26	0.43	0.02	-	100.00
Mining Ind.	1.39	0.65	1.29	4.83	6.03	0.57	6.53	16.42	-	60.86	1.36	0.08	-	100.00
Manuf. Ind.	0.25	0.33	0.61	2.15	2.98	1.18	15.92	49.80	-	25.49	1.28	0.01	-	100.00
Food	0.33	0.58	0.34	4.56	5.91	3.64	4.92	55.01	-	20.78	3.89	0.02	0.01	100.00
Textiles	0.07	0.17	0.05	0.89	1.30	0.36	19.63	40.84	0.01	36.37	0.31	-	-	100.00
Chemical prods.	2.88	1.46	6.60	5.24	12.68	6.43	3.51	35.43	-	21.71	4.03	0.03	-	100.00
Metallurgy	0.38	0.24	0.15	1.83	2.14	0.28	17.66	65.15	-	11.19	0.97	0.02	-	100.00
Miscellaneous	0.13	0.40	1.22	3.06	3.75	1.21	15.33	58.08	-	15.23	1.55	0.02	0.01	100.00
Construction	1.65	0.12	0.52	2.09	1.14	0.06	5.73	68.81	0.01	19.49	0.38	-	-	100.00
Power	1.03	1.32	0.64	5.47	13.74	0.65	22.90	11.31	-	39.85	3.07	0.03	-	100.00
Transport	0.15	0.44	1.26	2.49	10.87	0.27	2.00	47.27	0.02	33.96	1.20	0.07	-	100.00
Commerce	0.38	0.97	0.18	3.35	7.74	82.56	0.43	1.27	-	2.43	0.67	0.01	-	100.00
Banking, Ins.	0.85	4.62	0.32	10.56	57.43	6.74	0.59	1.80	-	16.08	0.90	0.11	-	100.00
Publ. Serv.	1.68	2.72	2.12	3.79	18.44	0.24	1.13	4.91	-	44.63	-	20.30	0.03	100.00
Education	0.30	81.20	1.02	0.75	7.48	0.05	0.98	2.05	-	5.53	0.48	0.09	0.08	100.00
Pers. Serv.	2.27	2.78	4.85	2.57	4.15	2.16	2.02	6.68	-	71.21	0.65	0.07	0.58	100.00
Not specified	0.58	0.92	0.40	1.96	12.05	0.50	0.88	3.26	0.02	6.19	72.99	0.26	-	100.00
TOTAL	0.50	2.32	0.78	26.82	3.73	7.42	2.93	12.97	8.26	30.16	3.28	0.78	0.06	100.00

When, however, we come to consider the location of the professional personnel trained for rural-area type of work, i.e. agronomists and veterinarians, we find that only 10 per cent of the former and 25 per cent of the latter are in rural areas. It might be supposed that they operate from the towns but, with such wide discrepancies, the only conclusion is that there is a complete lack of incentives to work in rural areas. Little more than half the agronomists are directly employed in the agricultural sector, almost a quarter of them are in the civil service and the remainder in other activities. Peru lacks highly skilled workers on the spot to direct and implement such a vast and arduous operation as agrarian reform.

The chemical and petroleum industries have the highest proportion of engineers and scientists. This is partly due to the large number of foreigners engaged in these industries, and also to the fact that this sector includes pharmacies. In other industrial sub-sectors the proportion of this category of workers is very small, especially in textiles, where there is one engineer for almost 1,500 manual workers. A breakdown will be given later of scientific and technical personnel in certain sectors, by occupational sub-groups (see Table N° 3-23).

There is apparently a fairly close relationship between the professional specialties and the industrial activities of these workers in the sense that chemical engineers are concentrated mainly in the chemical industries, civil engineers and architects in the construction industry, etc. The second category of highly-qualified professional workers includes, according to the classification used, professors and teachers and other persons of the same level, such as lawyers, economists, accountants, notaries, actuaries, sociologists, philologists, etc. Teachers, who form the majority of this category, were considered in the preceding chapter. The others are approximately the same in number as the scientific and technical personnel, and are split up among the various activities in more or less the same proportion as the latter, but are more heavily concentrated in such services as commerce, banking and insurance, and the civil service.

The intermediate category includes technicians who are known to be in short supply in all developing countries (see classification in the Annex). It is difficult to define the concept of "technician" as an intermediate group between top-level professional staff and manual workers, and even more difficult to identify and select this

Table 3-23

BREAKDOWN OF HIGHLY QUALIFIED SCIENTIFIC AND TECHNICAL PERSONNEL, BY OCCUPATIONAL SUB-GROUP IN SELECTED ECONOMIC SECTORS, 1961

(In percentages of the sector manpower)

Occupational sub-group	MANUFACTURING INDUSTRIES					Mining industries	Construction	Public sector
	Food products	Textile and ready mades	Chemical products	Metallurgy	Others			
Proportion of scientific and technical personnel	0.33	0.07	2.88	0.38	0.13	1.39	1.65	1.68
From:								
Agronomists and zoologists	0.01	-	0.03	-	-	-	-	0.20
Mining engineers	-	-	-	0.02	-	0.52	0.01	0.01
Civil engineers and architects	0.01	0.01	0.03	0.05	0.01	0.19	1.47	0.35
Electrical, mecanical and industrial engineers	0.10	0.03	0.07	0.17	0.02	0.09	0.07	0.03
Chemical engineers and metallurgists	0.14	0.03	1.84	0.13	0.09	0.39	0.08	0.15
Physicists, geologues	-	-	-	0.01	-	0.12	0.02	0.05
Veterinaries, zoologists biologists	0.02	-	0.07	-	-	0.01	-	0.10
Doctors and medical specialists	0.02	-	0.07	-	0.01	0.06	-	0.58
Dentists	0.02	-	-	-	-	0.02	0.01	0.15
Certificated pharmacists	0.01	-	0.76	-	0.01	-	-	0.06

occupational group from a given census classification. The intermediate technicians seem to constitute a functional category(1) rather than a definite occupational class, and it is in reality the organisational structure of the particular firm that determines which workers actually carry out functions of this type. In practice it appears that such intermediate posts may often be occupied by either professional staff with a university training or by skilled workers. This inefficient situation is obviously due to the fact that there are no workers linking management and production.

In evaluating the present situation on the basis of the information available we have here preferred to use the term "intermediate staff", which is more restricted. For estimating the future structure of the labour force, however, a fuller meaning has been given to the term, so as to stress the very important function of technicians.

Most of the intermediate category consists of nurses and social assistants employed in the personal and public service sectors. Apart from these medical and social workers, there are other intermediate technicians whose numbers slightly exceed those of scientific and technical professional staff. In fisheries and transport the proportion seems fairly high due to the comparatively large number of ships pilots and communications technicians employed in these sectors; however, the number of land surveyors (approximately 250) in agriculture, and of draughtsmen and other technicians in building and the power sector, is extremely low. The situation is most favourable in the manufacturing industries: the chemical industries have just over two technicians for every scientist (especially laboratory technicians and assistants) or one technician for every ten workers. In the final manufacturing sub-sector there is also a fairly large number of intermediate workers, such as decorators, although the textile and metallurgical industries have fewer than 100 technicians each.

In view of the strategic position occupied by this group of workers in the organisation of production in most of the dynamic sectors of the economy, their numbers and skills will have to increase considerably in the future. It is not simply a question of providing additional training for skilled workers, or of utilising and employing semi-trained professional staff, for intermediate posts require special qualities of technical and organisational skill. It is essential, therefore, to select the candidates and draw up their curricula with great care and in accordance with practical requirements.

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(1) In fact the training of these technicians is functional in character rather than to provide skills in specific occupational techniques.

The director, manager and administrator category includes farm managers. Unfortunately the basic census material does not allow us to get a more detailed breakdown of this sub-group. According to the report of the National Directorate of Statistics and Censuses the number of farm managers is 793,000, much the same figure as that obtained by the special tabulation. In view of the conditions in agriculture, it is fairly certain that the workers in this sector, including their dependants, perform a wide range of jobs that, strictly speaking, are not all agricultural. Agriculture is very much bound up with the seasons and does not entail continuous operations; most of the farms are very small (according to the First Agricultural Census 70 per cent of them have under 3 hectares). The farmer is employed on his land only at certain times of the year, he is sometimes assisted by members of his family or by other unpaid workers but, outside these periods, he tries to find other work, either in agriculture or elsewhere. Consequently, agricultural manpower cannot be assessed in the same way as industrial manpower, since the term "employment" has a different meaning in each sector. Under agrarian reform a greater number of agricultural workers will be provided with more land of their own, but this in itself will not ensure greater production or employment. Experience in other countries has shown that the size and quality of the land in question will support the new owners, who should accept new ideas and introduce new production methods. At the same time as the land is redistributed, agricultural information services must be set up and intensive training courses provided to enable landless peasants to become independent producers, with the necessary knowledge to use their production and marketing possibilities and run their holdings efficiently. Unless this new class of farmer is created, it is very doubtful whether agrarian reform will achieve the desired results or whether the farmer will be better off than before.

The age-structure for those employed in agriculture shows a relatively large proportion of older persons, see Table N° 3-24; 43 per cent of the independent farmers are over 45 years of age. On the other hand, a large proportion of agricultural labourers are under 25.

Table 3-24

DISTRIBUTION OF THE ACTIVE POPULATION BY OCCUPATIONAL CATEGORIES, SEX, AREA, AND AGE GROUP (Relative figures in %)

Occupational category	Men	Urban zone	Breakdown by age			
			under 14 years	15-24	25-44	45 years and over
Highly qualified scientific and technical personnel	84.7	93.5	0.2	4.6	73.3	21.9
Highly qualified personnel other than scientific and technical	51.0	85.3	0.1	15.7	62.2	22.0
Intermediate Staff	56.4	93.6	0.2	24.5	58.5	16.8
Farmers	89.2	17.2	-	9.1	47.7	43.3
Directors and agents (not agricultural)	89.0	90.7	0.1	7.8	54.3	38.0
Office workers	65.4	94.0	0.1	29.4	55.6	15.0
Salesmen	70.1	83.2	0.9	24.8	48.3	26.0
Skilled manual workers	92.5	85.8	0.1	22.9	52.8	24.2
Semi-skilled workers						
- agriculture (a)	82.2	17.6	5.6	44.9	34.6	14.9
- other sectors	61.5	76.5	4.5	34.4	43.5	17.6
TOTAL	78.2	49.8	2.6	29.2	43.8	24.3

(a) Including family help.

On the assumption that land is usually inherited and at a fairly advanced age, the differences in the age-structure give the impression that the exodus from the rural to the urban areas concern farmers rather than agricultural labourers. This conclusion, which seems to contradict the ideas usually held, should be checked in view of its possible bearing on agricultural and human resources policies. A lowering of the average age of farmers is essential if agriculture is to be modernised and developed.

A general assessment of directors, managers and administrators outside agriculture is not possible. There are marked differences between sectors, although these seem to be mainly differences in structure and in the form of industrial organisation. The high percentage in banking and insurance, for example, may be attributed to the large degree of internal and external decentralisation in this field. The relatively high proportion in mining, chemicals and power, all relatively modern industries, suggests a correlation between the technological level and the expansion of the firm's managerial staff. However, this correlation is very complicated, and may not hold for all industries.

In the commercial sector, the many shopkeepers are counted as sales personnel. The 8,800 classified as managers, agents etc., are employed in the larger commercial firms. Of the 217,000 persons classified as sales staff, 60 per cent are owners of retail shops, 4.5 per cent are wholesale merchants, 13 per cent are itinerant salesmen, and the remainder (22 per cent) sales employees.

The number of persons employed in trade is very large, and the proportion of independent retailers excessive. A simple calculation shows one independent retailer for every 63 inhabitants, and this ratio is even higher in the towns. No doubt this sector conceals a substantial amount of under-employment, especially among itinerant salesmen, while the high degree of dispersal handicaps the efficient marketing of goods. The fact that the value added per worker in the commercial sector is fairly high (see Table N° 3-12) is apparently due more to the high profit margins, particularly in the widely used instalment system, than to the efficient organisation of trade.

The available data show that the commercial function is only rarely incorporated in industrial firms. In the manufacturing industries the proportion of sales personnel is only a little over one per cent; it is highest in the chemical sub-sector where special quality products have to compete on an international market. According to the samples obtained from the First Economic Census - to be discussed later in relation to employment forecasts - a positive correlation has been found to exist for all industrial sectors between the level of productivity per worker and the proportion of sales staff to total staff in the firm. This confirms the fact that a more active sales policy on the part of producers lead to a considerable expansion of the market. Development forecast should therefore show a relative reduction in the number of workers in the commercial sector but a fairly substantial increase in the number of sales staff in other sectors, especially manufacturing industries. This trend reflects a certain amount of mobility between sectors for this occupational category, and also implies a change in the function and education of these workers.

Approximately half the national labour force is made up of manual workers; this category includes a large number and variety of occupations and any grouping is necessarily artificial and arbitrary. For this general survey the occupational groups have been classified as for the Census, into three main sub-categories; skilled, semi-skilled and unskilled. The problems which arise here are not solved satisfactorily: the original codes group together heterogeneous and non-equivalent occupations under one hèading and, for the same occupation, there often exist various degrees of skills and methods of training. For instance, the technical requirements for an electrician in a large electro-technical industry obviously differ from those for an electrician in rural workshop. To obtain reasonably objective criteria we have used the occupational definitions prepared by the International Labour Office(1), the adaptation of these made by the Peruvian Employment and Human Resources Service(2), and, to a certain extent, the standard classification prepared for the Mediterranean Regional Project(3).

In a general evaluation it is not practicable to examine in detail the breakdown of these three classes of workers for each economic sector, since this would require far more detailed information and concentration on a series of specific occupations in certain industries. The distinction made in this Report is simply to obtain a rough idea of the present situation to see how it can be improved in the long run.

Some points, however, deserve comment: first, the fact that more than half the unskilled workers are employed in the agricultural sector, and nearly another quarter in personal services. On the other hand, just over 70 per cent of the semi-skilled workers(1), and 85 per cent of the skilled workers, are employed in the industrial sectors; though the highest proportion of semi-skilled and unskilled workers in these sectors is found in mining and construction. As we have seen, for the labour force these jobs come half way between agriculture and modern industry.

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(1) ILO, Uniform International Classification of Occupations, Geneva 1958.

(2) "Clasificación Nacional de Ocupaciones del Perú", 1964.

(3) OECD, "The Planning of Education for Economic and Social Development", Paris 1963.

For government and local administration the original data showed a large percentage of workers whose occupation was not specified; these probably consist not only of workers under contract, but also of manual and office workers (this latter group seems to be relatively under-estimated, according to the summary for the government sector). This has made it necessary to add the whole of the group in question (approximately 45,000 persons) to the unskilled category.

3.6.3. Educational standard of the labour force, by occupational category

Table N° 3-25 which gives the "educational structure" of the various occupational categories, expresses each element as a percentage of the total active population in 1961, so as to facilitate both horizontal and vertical comparisons and also the incorporation of new entrants during the period 1961-1980 into the base year structure, to determine the 1980 situation and compare it with that at the start.

The manpower structure brings out existing shortages and permits the necessary corrections to be planned; on a decreasing scale it carries over into the future, constituting about a third of the total labour force in 1980. After forecasting the occupational structure we shall now briefly examine the educational level of the existing active population, to be able to forecast its trend up to 1980.

A cross-classification of occupational categories and educational levels (Table N° 3-25) shows a fair degree of correlation between these two factors. A few high-level professional staff are shown as having "no education", and this is almost certainly due to

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(1) The unusually high percentage of semi-skilled workers in fisheries is due to the definition of the occupations relating to this sector.

Table 3-25

BREAKDOWN OF THE ACTIVE POPULATION, BY OCCUPATIONAL CATEGORY AND EDUCATIONAL LEVEL, 1961
(in percentages (a))

Educational level / Occupational categories	No education	Primary	Secondary		Higher				Other forms of educ.	Not specified	TOTAL
			General	Technical	Teacher training	Humanities	Medicine	Science and technology			
Scientific and technical personnel	0.01	0.01	0.01				0.22	0.24			0.50
Not scientific and techn. personnel	0.01	0.32	0.75	0.16	0.48	0.46	0.01	0.05	0.05	0.03	2.32
Intermediate	0.01	0.27	0.29	0.03		0.04	0.01	0.02	0.10	0.02	0.78
Directors and agents	0.05	0.49	0.66	0.07	0.01	0.10	0.01	0.10	0.02	0.05	1.57
Farmers	12.02	12.12	0.46	0.01		0.02		0.01	0.01	0.56	25.25
Office workers	0.01	0.92	1.99	0.43	0.01	0.16	0.01	0.04	0.10	0.05	3.73
Salesmen	1.00	4.36	1.43	0.15		0.06	0.01	0.04	0.03	0.33	7.42
Skilled workers	0.11	2.09	0.55	0.08					0.03	0.04	2.93
Semi-skilled not agricultural	1.06	9.27	1.57	0.18					0.03	0.27	12.40
Semi-skilled agricultural	0.04	0.48	0.02							0.03	0.57
Agricultural family workers	4.05	3.97	0.09	0.02						0.14	8.26
Unskilled workers not agricultural	4.15	8.18	0.71	0.08					0.03	0.91	15.51
Unskilled workers agricultural	6.84	7.15	0.17	0.01						0.48	14.65
Unspecified	0.70	2.65	0.79	0.13		0.03		0.02	0.18	0.21	3.28
Military		0.37	0.31	0.01		0.01			0.06	0.01	0.78
Church			0.01			0.04					0.06
TOTAL	30.06	52.65	9.81	1.36	0.50	0.92	0.27	0.54	0.64	3.13	100.00
(In thousands of persons)	938.11	1643.10	306.15	42.44	15.60	28.71	8.42	16.85	19.97	97.68	

(a) As percentages of the total active population (3,120.8 thousand persons) errors in the Census. All medical practitioners and almost all scientists and engineers have had a higher education.

To avoid overloading the table drawn up especially for this survey, and to refer more easily to the results, we have not referred to the school grades completed(1). Only for primary and secondary levels has a distinction been made between those with three years' study or less, and persons with four years' study or more. Consequently it is not possible to give the level of education corresponding to the studies completed.

This does not matter for the first group, specialised scientific and technical personnel, since the nature of their jobs implies that their studies were completed, but it does matter for the other categories. More than half of the non-scientific and non-technical professional staff (the majority of whom are teachers) have not received a higher education, and 28 per cent left at the primary or secondary level.

Among the "intermediate" staff are workers who attended the university, but very few on the technical side, and most of them did not complete more than half the course. It is difficult to see how the present form and quality of technical education will provide the technicians the economy so badly needs (see the last part of paragraph 2.3.6 of this Report). This type of training generally produces office and semi-skilled workers, most of whom unfortunately leave before completing the course. This is very regrettable, and shows that special educational institutions are needed for training this important category of workers.

The low educational level of the rural population is well known, and it is interesting to see how this affects the active population in these areas. Just below 50 per cent of farmers have not been to school; many of them are not illiterate, however, as they learned to read and/or write outside school. Almost all the remaining 50 per cent attended primary school only, but barely a quarter of them attended for more than three years. This means that practically 85 per cent of agriculturists have not received even three years' elementary education. The same is true of family workers and unskilled agricultural labourers. Semi-skilled agricultural workers, however, have a higher standard of education: only 7 per cent have had no education; of the 15,500 who attended secondary school, almost half continued beyond the first cycle. Technical education in farming has proved a failure: of the 3,000 farmers who stated they had taken this course not one completed it.

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(1) It would, of course, be a good thing to examine this aspect of education for the active population and compare it with similar data for the total population (see Table N° 2-03).

The "managerial and office worker" categories show more varied types of education; most have a secondary, and a fairly large number a more advanced, education. Together with the sales staff they form the white collar workers, among whom there is a certain amount of under-utilisation, since workers perform duties beneath their occupational skills. Of the "human science" graduates, (law, literature, economics etc.) only 50 per cent are employed in a professional capacity; 17 per cent are employed as office workers, 11 per cent are in managerial posts, and a further 11 per cent are employed as intermediate or sales personnel. Of those who studied science or technology, nearly 40 per cent are not employed in professional posts.

The general educational level of the various occupational categories may be expressed in the form of the average number of years' study each group has had. Since the exact number of grades passed in each stream is not known, each stream can be assigned an estimated average weighted according to the frequency in each occupational category. Any error is systematic and does not invalidate the comparison; differences due to sex, age or area may be brought out in this way (see Table N° 3-26).

The results of these calculations show significant differences in the educational level of the various occupational categories.

The scientific and technical professional staff average more than 14 years' education, and the women in this category half a year more than the men. The average for office workers is higher than that for intermediate staff, and for both the female average is slightly higher than the male. Up to now, women do not form the majority in any of the professional categories. Forty-nine per cent of the non-scientific and non-technical professional staff are women (almost exclusively teachers and professors) and forty-four per cent of the intermediate staff (especially medical and social workers), and 35 per cent of the office workers.

In view of women's increasing role in education and business a larger proportion of women is to be expected in these intermediate

Table 3-26

BREAKDOWN OF THE ACTIVE POPULATION, BY NUMBER OF YEARS SCHOOLING, OCCUPATIONAL CATEGORY, SEX, AREA AND AGE-GROUP (1961)

Occupational category	Sex		Zone		Age-group			
	Men	Women	Urban	Rural	Under 14 years	15-24	25-44	45 years and over
Highly qualified scientific and technical personnel	14.2	14.7	14.3	8.3	-	-	14.2	14.5
Highly qualified personnel other than scientific and technical	10.5	10.0	10.4	7.9	-	9.5	11.3	10.1
Intermediate	7.6	7.8	7.8	5.5	-	6.9	8.4	6.8
Farmers	1.7	0.5	2.6	1.3	-	1.9	1.8	1.2
Directors and agents (not agricultural)	8.1	6.5	8.4	5.5	-	6.6	8.2	7.7
Office workers	8.2	8.4	8.2	6.4	-	8.6	8.5	7.3
Salesmen	5.1	3.0	4.7	2.3	2.6	4.7	4.7	3.8
Manual workers - agriculture (a)	1.7	0.6	2.2	1.4	0.9	1.7	1.5	1.0
- other sectors	3.9	2.1	3.8	1.9	1.2	3.4	3.7	3.0
TOTAL	3.2	2.7	9.1	1.5	1.1	3.1	3.6	2.6

(a) Including family help.

categories in the near future. This trend will doubtless have some influence on the human resources policy (employment possibilities, wage structure, etc.), and a more detailed examination will have to be made.

The average length of farmers' and manual workers' education is very low - less than two years.

The average schooling time for women employed in agriculture is only 6 months. The difference between the sexes in educational standards is greater in lower-level jobs. Since these categories form the greater part of the labour force they considerably influence the average level of the active population, which is barely 3 years' schooling.

The difference between the educational level in urban and that in rural areas is very pronounced. The urban general average is 9 years' schooling, compared to 1.5 years in rural areas. There is even a considerable difference in the level of professional staff as between urban and rural areas. Only 6.5 per cent of the scientific and technical personnel live outside the towns, and their educational level is much lower; the average of 8.3 years is equivalent to primary education plus half the secondary course. The other (i.e. non-scientific or non-technical) are mostly employed in education and, since there are no higher training colleges in the rural areas, the standard of the teachers (an average of less than 8 years) is by no means high. In the other occupational categories there is a difference of more than 2 years schooling.

The educational level of workers who are over 45 is lower than that of those who are younger (except, of course, of children who are already working). Even so, the coefficient of the educational level for the 15-24 age-group is lower than that for the 25-44 age-group. This does not mean that the younger generation is less educated, but that most of the student population is in this age-group and is not included in the active population. Since the age level at which university students usually complete their studies is very high there are few professional workers below the age of 24. The extension of education, however, causes a substantial variation in activity rates, and the extent to which this affects the 1961 educational structure of the labour force should be ascertained. All things considered, the educational level of the labour force as a whole is so low that the differences will not matter very much unless there is a general raising of the educational level of all the active population.

The annexes contain a cross-classification of economic sectors and educational levels. Although this is not very important, out of curiosity we calculated the average number of years' schooling of the labour force for each sector of activity. After education (with an average of 10.4 years' study), banking and insurance, and public administration have the highest "consumption" of education (9 and 6.9 years, respectively). In industry the average is roughly 4 years, going up to 6 years in the chemical industry and down to 3.2 years in the textile industry. As we have already pointed out: that half of the active population which is employed in the agricultural sector averages only 1.5 years' schooling.

Table N° 3-27 compares the educational structure for the total population with that for the active population.

Table 3-27

COMPARISON (1) OF THE EDUCATIONAL LEVEL FOR THE TOTAL POPULATION WITH THAT FOR THE ACTIVE POPULATION (1961)

(as percentage of total)

EDUCATIONAL LEVEL	Total population 4 years and over	Active population
No education	68.3	30.1
Primary - First cycle	11.3	30.4
- Second cycle	14.3	22.3
Ordinary Secondary - First cycle	1.5	5.2
- Second cycle	2.8	4.6
Technical Secondary - First cycle	0.4	0.8
- Second cycle	0.2	0.6
Teacher training	0.2	0.5
University	0.6	1.7
Other education	0.3	0.6
Unspecified	-	3.1

(1) This Table is included by way of illustration only. The two sets of data are not fully comparable since, besides age differences, the data for the total population indicate levels and cycles successfully completed, while those for the active population indicate levels and cycles attended but not necessarily completed.

3.7. Future Manpower Requirements

3.7.1. Forecast of the 1980 occupational structure by economic sector and occupational category

In earlier forecasts of the breakdown of employment by economic sector and sub-sector account was taken of a series of qualitative factors such as policy objectives and structural improvements. The sector analysis and evaluation made of the occupational structure in 1961 was also intended to bring out any structural defects in the occupational composition of the labour force, such as the unsatisfactory distribution of medical practioners and the acute shortage of technical intermediate personnel. As we shall see later, many of these same factors influence the forecast of the occupational structure for 1980.

The new "model" occupational structure by economic sector is shown in Tables N°s 3-28 and 3-29; the former gives absolute figures, and the latter percentages.

The 1980 occupational structure includes specific improvements in the quality of the labour force; the redistribution or "balancing" of certain occupational categories and sectors; consideration of the social objectives of certain kinds of professional services (especially the medical service), and correction of obvious deficiencies in some occupations.

Employment estimates by occupational category for the industrial sectors and sub-sectors of the manufacturing industry have been based on a quantitative analysis of a survey of 243 establishments in the manufacturing industry. The survey based on the Economic Census of 1963 showed close correlation between the productivity level of the industry and the percentage strength of certain occupational categories in the labour force, especially professional staff and intermediate employees and skilled workers. These, then, are the two main bases of the forecasts which follow.

The forecasts will not be discussed in detail. Only those sectors will be considered in which the quantitative and qualitative changes anticipated are due to special factors, i.e. agriculture, construction, government service, education, and manufacturing. Specific mention will be made of certain general topics in passing, however.

Table 3-28

OCCUPATIONAL BREAKDOWN OF THE ACTIVE POPULATION IN 1961
AND ESTIMATED BREAKDOWN FOR 1980, BY ECONOMIC SECTOR

(in thousands of persons)

Occupational category / Economic sector		Highly qualified scientif. and tech. personnel	Highly qualified personnel other than scientif. and tech.	Inter-mediate	Directors and agents	Office workers	Sales-men	Skilled workers	Semi-skilled and un-skilled workers	Family help	Military	Total
Agriculture	1961	0.85	0.35	0.55	794.00	2.85	0.25	1.55	475.25	257.85	-	1,534.05
	1980	2.71	0.69	25.10	1,391.81	.01	3.93	5.32	582.83	293.10	-	2,311.50
Fisheries	1961	0.03	0.05	0.19	0.21	0.25	0.03	0.09	20.15	-	0.01	21.07
	1980	0.07	0.11	0.60	0.43	0.55	0.13	0.37	40.22	-	0.02	42.50
Mining industries	1961	0.93	0.43	0.86	3.20	4.00	0.38	4.33	51.25	-	0.05	66.31
	1980	1.34	0.61	2.07	3.59	5.67	0.49	10.54	69.70	-	-	94.01
Manufacturing industries	1961	1.06	1.37	2.50	8.84	12.25	4.85	65.42	309.37	0.02	0.06	410.89
	1980	6.16	6.00	11.63	23.48	55.54	26.44	205.59	576.86	-	-	911.70
Construction	1961	1.73	0.13	0.54	2.19	1.19	0.06	6.00	92.40	0.01	-	104.65
	1980	7.05	1.03	9.27	12.57	15.91	0.51	52.85	413.91	-	-	513.10
Power	1961	0.09	0.11	0.06	0.47	1.18	0.06	1.97	4.39	-	-	8.58
	1980	0.54	0.23	0.55	1.33	4.30	0.10	8.07	14.29	-	-	29.41
Transport	1961	0.14	0.41	1.18	2.34	10.21	0.25	1.88	76.28	0.02	0.07	93.91
	1980	1.05	1.29	5.53	7.64	33.25	0.74	21.62	182.68	-	-	253.80
Commerce	1961	1.01	2.56	0.47	8.81	20.35	217.09	1.14	9.74	-	0.03	262.95
	1980	2.42	7.91	3.36	22.79	96.69	369.01	19.30	68.82	-	-	590.30
Banking, insurances	1961	0.16	0.87	0.06	1.99	10.82	1.27	0.11	3.37	-	0.02	18.84
	1980	0.32	2.30	0.14	3.03	22.77	2.57	0.30	4.07	-	-	35.50
Public sector	1961	1.95	3.15	2.46	4.39	21.33	0.28	1.31	57.29	-	23.48	115.65
	1980	8.87	13.48	30.77	15.03	79.58	0.96	11.90	58.10	-	34.75	253.44
Education	1961	0.20	53.52	0.67	0.50	4.93	0.03	0.65	5.00	-	0.06	65.91
	1980	-	142.46	-	-	24.11	-	-	23.48	-	-	190.05
Other services	1961	6.71	8.19	14.31	7.59	12.25	6.38	5.96	229.81	-	0.22	295.05
	1980	25.37	17.70	57.87	14.65	26.93	6.34	15.74	287.68	-	-	452.28
TOTAL	1961	15.54	72.25	24.32	836.91	116.39	231.51	91.45	1,345.89	257.92	24.30	3,120.81
	1980	55.90	193.81	146.89	1,496.35	371.3	411.22	351.60	2,322.64	293.10	34.77	5,824.69

NOTE: The heading "non-specified" has been omitted, since it does not provide any bases for comparisons or estimates.

Table 3-29

OCCUPATIONAL BREAKDOWN OF THE ACTIVE POPULATION IN 1961 AND ESTIMATED BREAKDOWN FOR 1980, BY ECONOMIC SECTOR
(in percentages)

Economic sector \ Occupational catégories		Scientif. and tech. personnel	Non scient. & non tech. personnel	Inter-mediate	Directors and agents	Office workers	Sales-men	Skilled workers	Semi-skilled and un-skilled workers	Family help	Military	Total
Agriculture	1961	.06	.02	.04	51.76	.19	.02	.10	30.98	16.81	-	100.00
	1980	.12	.03	1.09	60.21	.26	.17	.23	25.21	12.68	-	100.00
Fisheries	1961	.12	.21	.90	1.00	1.16	.12	.40	95.64	-	.05	100.00
	1980	.16	.26	1.41	1.01	1.29	.31	.87	94.64	-	.05	100.00
Mining industries	1961	1.39	.65	1.29	4.83	6.03	.57	6.53	77.28	-	.08	100.00
	1980	1.43	.65	2.20	3.82	6.03	.52	11.21	74.14	-	-	100.00
Manufacturing industries	1961	.25	.33	.61	2.15	2.98	1.18	15.92	75.29	-	.01	100.00
	1980	.68	.66	1.28	2.58	6.08	2.90	22.55	63.27	-	-	100.00
Construction	1961	1.65	.12	.52	2.09	1.14	.06	5.73	88.30	.01	-	100.00
	1980	1.37	.20	1.81	2.45	3.10	.10	10.30	80.67	-	-	100.00
Power	1961	1.03	1.32	.64	5.47	13.74	.65	22.90	51.16	-	.03	100.00
	1980	1.84	.78	1.87	4.52	14.62	.34	27.44	48.59	-	-	100.00
Transport	1961	.15	.44	1.26	2.49	10.87	.27	2.00	81.23	.02	.07	100.00
	1980	.41	.51	2.18	3.01	13.10	.29	8.52	71.98	-	-	100.00
Commerce	1961	.38	.97	.18	3.35	7.74	82.56	.43	3.70	-	.01	100.00
	1980	.41	1.34	.57	3.86	16.38	62.51	3.27	11.66	-	-	100.00
Banking, insurance	1961	.85	4.62	.32	10.56	57.43	6.74	.59	17.88	-	.11	100.00
	1980	.90	6.48	[illegible]	8.54	64.14	7.24	.85	11.46	-	-	100.00
Public sector	1961	1.68	2.72	2.12	3.79	18.44	.24	1.13	49.54	-	20.30	100.00
	1980	3.50	5.32	12.14	5.93	31.40	.38	4.70	22.92	-	13.71	100.00
Education	1961	.30	81.20	1.02	.75	7.48	.05	.98	7.58	-	.09	100.00
	1980	-	74.96	-	-	12.69	-	-	12.35	-	-	100.00
Other services	1961	2.27	2.78	4.85	2.57	4.15	2.16	2.02	77.89	-	.07	100.00
	1980	5.61	3.91	12.80	3.24	5.95	1.40	3.48	63.61	-	-	100.00
Total	1961	.50	2.32	.78	26.82	3.73	7.42	2.93	43.13	8.26	.78	100.00
	1980	.96	3.33	2.52	25.69	6.37	7.06	6.04	39.88	5.03	.60	100.00

Note: The heading "non-specified" has been omitted, since it does not provide any bases for comparisons or estimates.

Diagram 3-11

MANPOWER FORECASTS BY OCCUPATION CATEGORY

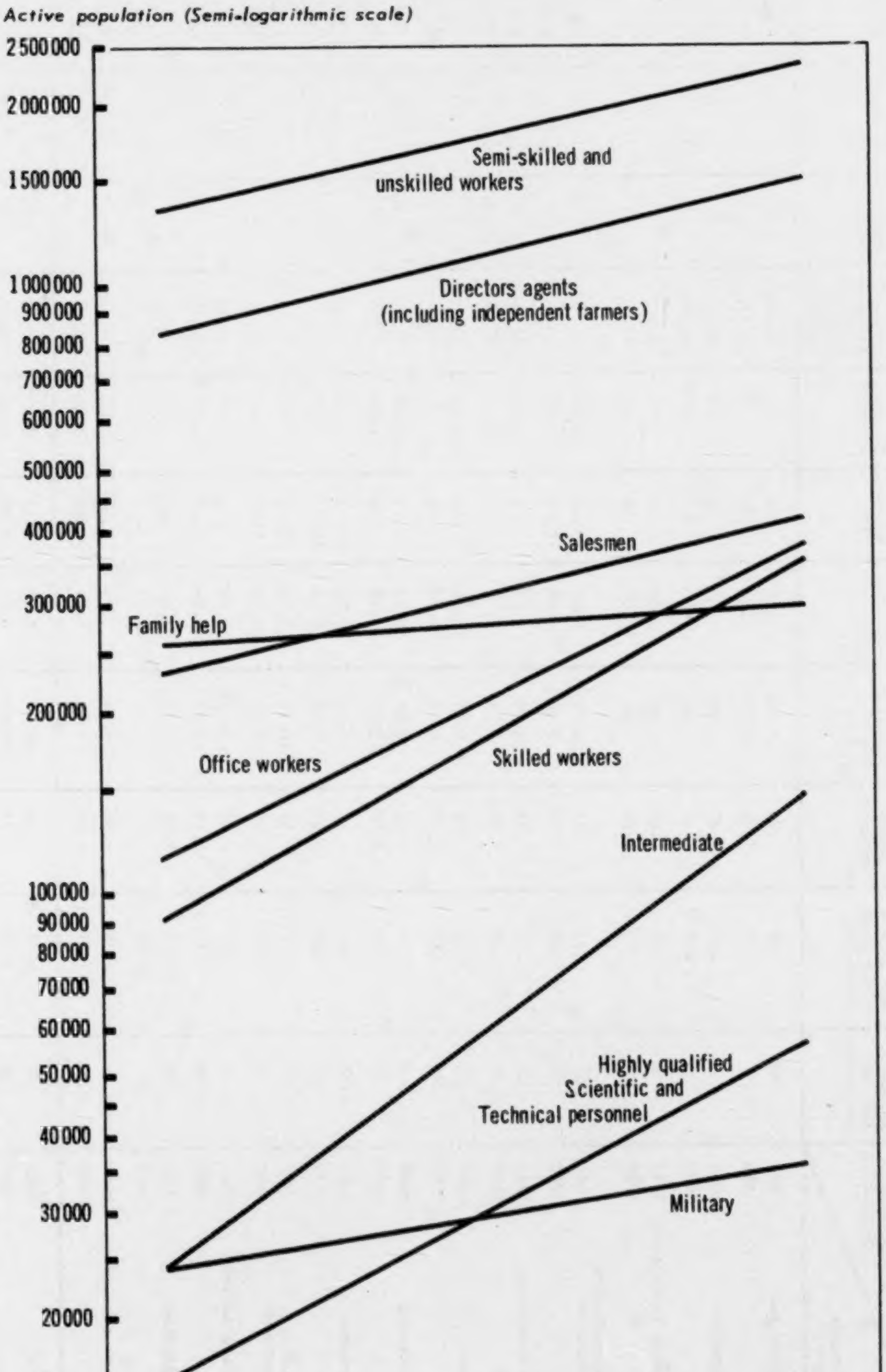
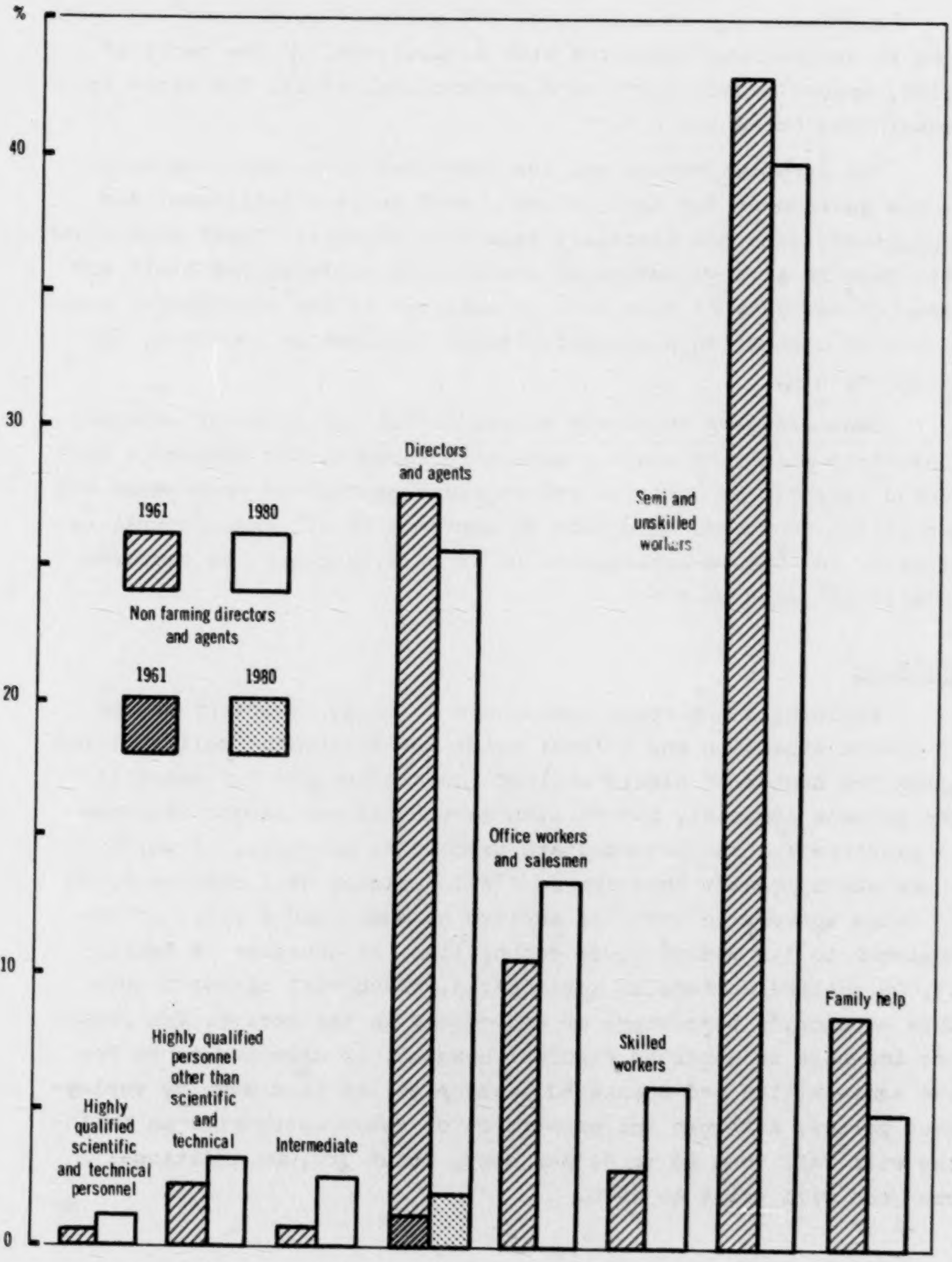


Diagram 3-12

BREAKDOWN OF MANPOWER BY OCCUPATIONAL CATEGORY, 1961-1980



In Peru, agriculture suffers from an acute shortage of technical professional and intermediate personnel. In 1961, there were only 1,400 professional and intermediate personnel directly employed in this sector, out of a total of 1,500,000 workers.

Approximately an additional 700 salaried government employees were in occupations connected with agriculture. Of the total of 2,100, approximately 1,275 were professional staff, the ratio to technicians being 1.5 : 1.

The agrarian reform and the technical improvements planned by the government for agriculture - such as land settlement and irrigation, plus the necessary expansion of agricultural production - will require a large number of specialised professional staff and technicians. Many of them will be employed by the government, especially in connection with agricultural information services, irrigation, etc.

Owner-farmers represent an additional agricultural category consisting mainly of small independent farmers. Its expansion will depend directly on agrarian reform, land settlement programmes and population increase. More than 60 per cent of all agricultural employment in 1980 is expected to be in this category, as compared with 51 per cent in 1961.

Building

Building has already been shown to be an important source of future expansion and a focal point for employment policy. Three times the number of highly skilled technicians are estimated in the present forecast, but an even more rapid and larger increase is expected for the intermediate technician category, of which there was a greater shortage in 1961. Building will require 8,700 of these workers in 1980, to achieve no more than a ratio of one engineer to 1.3 medium level technicians. An increase of nearly 47,000 skilled workers is anticipated, which will almost double this category's percentage of employment in the sector. The greatest increase in absolute figures, however, is expected to be for the semi-skilled and unskilled categories, as laid down by employment policy; although the proportion of these categories in building will fall from 88 to 81 per cent, about 320,000 additional new jobs will exist by 1980.

Government service

The great expansion of all top and intermediate level categories in the government sector reflects the need for a large-scale improvement in the quality of public services. (Almost 50 per cent of all persons employed in the public sector in 1961 belonged to the semi-skilled, unskilled or "unspecified" categories). The participation of government agencies in all phases of social and economic development is also giving an impetus to this trend.

The expansion of top level staff and medium level technical personnel will need 45,000 new jobs to be created in the period under review, while the increase in administrative, operative, etc., personnel will add another 100,000. The better occupational structure for government service in 1980 is borne out by the fall in the proportion of semi-skilled or unskilled workers to 21 per cent of employment in the sector.

Education

In education, which is not usually treated as a separate sector, labour force trends are fundamentally important for the planning of human resources and education, since teachers play a vital part in the education of the future active population. A preliminary estimate was made of the total needs for the economy, and was subsequently revised (see Chapter 4) to take into account the educational implications of the calculations for all sectors.

Only three occupational categories in education have been considered: teaching, administrative, and service personnel. The two latter categories have been estimated in direct proportion to the increase in the number of students. The other occupations in education are included in the government and services sectors.

Teachers of all types and at all levels will increase by almost 90,000 by 1980, not including replacements. Teachers represented only 1.7 per cent of the total labour force in 1961 and will increase to 2.4 per cent by 1980.

Services

This sector is often considered, in the same way as trade (itinerant vendors), as a residual sector for potentially unemployed persons, who may be used in a number of personal services, or as domestic servants. Top and intermediate level staff will be most affected by the changes, and the self-employed among these, especially nurses, medical practitioners, lawyers, architects, etc., will increase by almost two-and-a-half times by 1980. At the same time the proportion of semi-skilled and unskilled workers in this sector will fall from 78 per cent in 1961 to 65 per cent in 1980.

Medical personnel

Medical practitioners, dentists, nurses, pharmacists, radiologists, laboratory technicians and veterinarians play an extremely important part in economic and social activity. In the occupational breakdown for 1980, all medical practitioners, dentists and auxiliary medical personnel have been included in the services sector; veterinarians have been divided among agricultural, government and services sectors.

Except for veterinarians, whose work is mainly in agriculture, the various categories have been forecast in accordance with the social aim of achieving better health standards, and the ratio between medical practitioners or dentists and their respective auxiliary personnel.

In general, the ratio of doctors or dentists to inhabitants corresponds to the National Health Plans for 1966-1970. International comparisons of these ratios have also been made, bearing in mind the present numbers in the training centres of these two professions. The following table shows the number of persons per doctor in various countries.

Country	Year	Inhabitants per doctor
Belgium	1962	720
Colombia	1960	2,400
Cuba	1961	1,200
Equator	1960	2,600
Italy	1961	610
Mexico	1961	2,200
Peru	1961	2,200
Uruguay	1957	870
Venezuela	1962	1,400

Doctors, who numbered 4,400 in 1961, with a ratio of approximately 1 : 2,200 inhabitants, were heavily concentrated in the large urban centres, vast regions of the country then had practically no medical service of any kind.

By 1980 the number of medical practitioners in Peru is expected to be 11,170, which will change the medical practitioner: inhabitant ration to 1 : 1,650. Most of them will be in the services sector, as self-employed persons, but the number of State employed doctors will increase considerably with the extension of government medical services. This method of providing medical service for the whole population, and which has been very successful in other countries, is in fact the only way to ensure medical care in the sparsely populated areas.

Dentists totalled 1,700 in 1961, that is, a ratio of 1 dentist to every 5,900 inhabitants, the ratio of medical practitioners to dentists was approximately 2.6 to 1. The number of dentists is expected to increase to almost 5,000 by 1980, with a new ratio of 1 dentist to every 3,750 inhabitants, and a new medical practitioner to dentist ratio of 2.2 to 1.

If the increase in the ratio of doctors and dentists to population is used as an index for measuring the improvement, it is seen that the annual increase is 1.5 per cent for doctors and 2.4 per cent for dentists.

Forecasts for doctors and dentists also include those who will be teaching these professions. Although these persons are employed in the education sector, they have been included in the numbers for calculating the ratio per inhabitant since, besides teaching, they carry on their profession in either the public or private sector.

Intermediate technical personnel

In 1961, there was a serious shortage in Peru of intermediate technicians. The ratio of this category to scientific and technical professional staff, which is as high as 3 : 1 in some of the more developed countries and may be even higher in certain sectors or industries, was only 1.5 : 1 in Peru. In addition, almost 60 per cent of all intermediate-level staff were in the services sector, mostly in medical services or private businesses. Thus, only 550 of these technicians were employed in agriculture, 2,500 in manufacturing and 2,460 in government service. The supply of intermediate technical staff, which has been neglected in the past, must be increased and as from now education plans are making provision for the rapid expansion of training at this level. The forecast shows 146,000 in 1980 as against only 24,000 in 1961, the expansion must be mainly in the industrial sectors, so that the ratio of intermediate technical to higher scientific and technical personnel will go up to 2.6 : 1 by 1980.

Other occupations

Three other occupational categories will be affected by the rapid changes anticipated by the forecast of the occupational structure for 1980. Administrative and sales personnel will have to increase rapidly in view of the better sales and marketing facilities emerging as a result of industrialisation and the creation of new markets. In absolute figures, 355,000 new jobs should be created in the administrative services, and 180,000 more in direct sales. Although the percentage of sales personnel will decrease gradually, this is mainly attributable to the disappearance of many itinerant vendors and the concentration of commercial activities.

The increase in the number of skilled workers in the labour force, especially in the industrial sectors, requires an increase of 260,000 skilled workers by 1980. This category, which represented barely 2.9 per cent of the active population in 1961, will have to increase to 6.0 per cent by the end of the period under review. Although this increase does not appear high as a percentage, it represents an average of almost 14,000 workers a year, not counting the replacement of those who leave during the period covered by the Report.

Manufacturing industry

Occupational distribution in the manufacturing sector has not been dealt with until now for a number of reasons: the sector's importance for future economic growth (which will require a vast improvement in the skills of many occupational categories) and the need to have sufficient data for estimating, on the basis of the various sub-sectors, the future occupational structure of this sector.

In the chapter on productivity and the distribution of labour, the various industrial sub-sectors were shown to have marked differences in such variables as capital structure, productivity level and technology. Considerable differences also existed in the occupational breakdown of labour. Detailed data regarding productivity levels, size of establishments, power consumption and the occupational structure of manpower were obtained from 243 manufacturing firms in the 1963 Economic Census. Table N° 3-30 gives some of the results of this survey.

As the table shows, the firms were divided into two groups, according to their productivity, in each sub-sector. In most cases the highest productivity was found to be in the largest undertakings, and vice versa.

There appears to be a direct correlation between the productivity of each sector and the percentage of top level, medium level, and skilled personnel employed. There is also an inverse correlation between productivity and the percentage of semi-skilled and unskilled workers. An inverse correlation was also found to exist for such occupational categories as proprietors, salaried employees, family help and business-managers.

An analysis of each sub-sector shows the same correlation for top level and intermediate categories, except in the chemical industry. This is the only sub-sector where there is no inverse correlation between productivity and the number of proprietors, employees, or family help and business-managers. As this industry includes pharmaceutical as well as chemical products which are subject to strict quality control, many of the directors and administrators are probably specialists. The positive correlation found between the percentage of proprietors and directors and the level of productivity in this sub-sector (not found in the other sub-sectors or in the sector as a whole) would also lead to the conclusion that many professional employees also hold managerial posts.

The positive correlation between productivity and the percentage of skilled workers, and the inverse correlation for semi-skilled and unskilled workers, were also found in each sub-sector except metallurgy.

Subsequently an attempt was made by means of regression analysis to establish a relation between the differences in the occupational composition of the labour force and productivity levels. The results were not too satisfactory (the correlation coefficients obtained varied from .46 to .63) for the number of cases in each

Table 3-30

OCCUPATIONAL BREAKDOWN AND AVERAGE PRODUCTIVITY, BY BRANCH, IN THE MANUFACTURING INDUSTRY (81 GROUPS AND 3 ESTABLISHMENTS 1963)

Branches		Number of cases	Number of workers	Product per workers (thousands of soles)	Owners directors and adminis-trators	Higher executives	Interme-diate techniciens	Office workers	Salesmen	Skilled workers	Semi and unskilled workers
FOOD PRODUCTS AND BEVERAGES	High productivity	5	943	181.8	1.4	1.1	2.8	11.9	4.4	18.2	60.0
	Low productivity	8	504	58.8	1.7	0.6	0.4	10.4	3.1	10.2	73.7
	Average	13	673	125.1	1.6	0.9	1.7	11.2	3.8	14.6	66.2
TEXTILES AND READY MADES	High productivity	5	863	97.0	0.7	1.1	2.2	4.4	0.2	30.3	61.6
	Low productivity	14	508	47.5	1.1	0.6	1.7	8.9	1.2	21.6	64.9
	Average	19	601	66.2	1.0	0.8	1.9	7.2	0.8	24.9	63.4
CHEMICAL PRODUCTS	High productivity	4	289	155.9	3.7	3.5	3.2	22.4	8.7	8.2	50.3
	Low productivity	7	348	84.3	2.3	4.4	2.5	17.5	6.9	4.1	62.1
	Average	11	327	107.3	2.8	4.1	2.7	19.1	7.5	5.4	58.3
METALLURGY	High productivity	8	446	82.6	1.2	1.0	4.1	11.1	0.2	18.5	63.9
	Low productivity	7	143	44.1	2.6	0.9	2.9	10.6	0.3	26.5	56.2
	Average	15	305	74.2	1.5	1.0	3.8	11.0	0.2	20.3	62.2
OTHERS	High productivity	8	518	103.7	1.6	6.8	5.4	11.9	2.0	22.9	49.4
	Low productivity	15	285	47.8	1.9	0.7	1.4	12.9	1.7	22.0	59.4
	Average	23	366	75.3	1.8	3.7	3.4	12.4	1.8	22.4	54.5
TOTAL	High productivity	30	597	121.8	1.4	2.5	3.5	10.6	2.3	21.7	57.9
	Low productivity	51	370	54.6	1.7	1.1	1.5	11.3	2.4	17.2	64.7
	Average	81	454	87.3	1.6	1.8	2.5	11.0	2.3	19.4	61.4

category was too low to give very significant results, and the manufacturing industry in Peru is still very poorly integrated. Moreover, the likelihood of large technological differences between the various scales of operation might seriously affect the correlation.

Nevertheless, the obvious differences found when the firms in a sector were grouped solely according to level of productivity provided a firm basis for estimating the 1980 occupational structure for top and medium-level personnel and skilled workers. The same technique was used later for the power sector.

The formula used in the calculations takes the following general form for any occupational category, simple or composite:

$$E_{80} = E_{61} \cdot P_{61}^{80} \left(p' \cdot \frac{e'}{e''}\right)$$

Where

E = proportion of those employed in an occupational category in relation to the total number employed in the sub-sector.

P = relative productivity increase in the sub-sector.

p' = ratio between the productivity in the least and the most progressive firms, as observed in 1963.

e' = proportion of those employed in an occupational category in relation to the total number employed in the most progressive firms, as observed in 1963.

e'' = proportion of those employed in an occupational category in relation to the total number employed in the least progressive undertakings, as observed in 1963.

The technique described above was used to provide only a first approximation; it could not be applied to the base year figures to obtain the results shown in the final figures. Neither could it be used for all the occupational categories. The changes do not necessarily follow a rigid pattern, due to technological differences and substitution possibilities in the production process. Neither does the idea that the present structure represents the best possible situation for a given level of productivity give the impression of a dynamic approach. Consequently, the first approximations obtained were in all cases subject to evaluation and modifications, as is apparent from the final figures given in Table N° 3-31.

This table shows that there should be an increase of 18,000 persons in the first three occupational categories, i.e. high-level scientific and technical personnel, high-level non-scientific personnel and intermediate level personnel by 1980 in the manufacturing sector. Almost 12,000 of these should belong to the intermediate category, in view of the heavy shortage in 1961 and of its importance for industrial production. In addition to the expansion of this category, however, its better distribution among the sub-sectors was considered. The ratio of intermediate to scientific and technical personnel, which was 9.2 : 1 in the miscellaneous industries sub-sector in 1961, should become 1.5 : 1 by 1980, as a result of the considerable expansion in scientific and technical personnel and even in the chemical products sub-sector a relative decrease in the three top categories is anticipated, reflecting a better future distribution of these workers.

On the other hand, in the textiles and clothing sub-sector, which will account for more than one third of employment in the sector in 1980, the ratio of intermediate to top level staff will change from 0.7 : 1 in 1961 to 2.5 : 1 in 1980.

In absolute figures this represents an increase from barely 90 intermediate staff in 1961 to almost 2,000 in 1980.

For the whole of the manufacturing sector, the ratio of intermediate to top level scientific and technical personnel, which was 2.4 : 1 in 1961 should be 1.9 : 1 in 1980. This apparent fall is explained by the large increase expected for top level staff during the first few years of the period covered by the Report, considerable training facilities being already available. The intermediate-level training centres, however, which hardly existed in 1965, cannot tackle this job until 1975, as shown in Table N° 4-03, Chapter 4.

In 1961, the ratios: intermediate-level staff to skilled workers, and skilled to unskilled workers were 1 : 13.2 and 1 : 4.7 respectively in the manufacturing industry. In 1980 these ratios should have improved considerably, and are estimated at 1 : 8.6 and 1 : 2.8 (either semi- or unskilled) respectively.

The redistribution implied above will be possible partly as a result of the rapid increase expected for skilled workers, many of whose normal duties are now being performed by professional person-

Table 3-31

OCCUPATIONAL BREAKDOWN OF MANPOWER IN THE MANUFACTURING INDUSTRIES IN 1961 AND 1980 BY SUB-SECTORS

Occupational category / Industrial sub-sector		Highly qualified scientif. and tech. personnel	Highly qualified personnel other than scientif. and techn.	Inter-mediate	Directors and agents	Office workers	Salesmen	Skilled workers	Semi-skilled and un-skilled workers	TOTAL
		Absolute figures (in thousands of persons)								
Food products and beverages	1961	0.17	0.31	0.18	2.38	3.09	1.90	2.57	39.56	52.19
	1980	0.50	1.07	1.17	4.84	10.81	6.84	11.63	79.74	116.60
Textiles and ready mades	1961	0.13	0.32	0.09	1.72	2.50	0.69	37.65	148.07	191.77
	1980	0.78	1.24	1.96	3.91	14.64	5.51	103.77	194.28	326.09
Chemical products	1961	0.42	0.21	0.95	0.76	1.83	0.93	0.51	8.23	14.40
	1980	1.02	0.53	2.35	2.06	6.77	3.80	3.13	19.61	39.27
Metallurgy	1961	0.21	0.14	0.09	1.02	1.19	0.16	9.84	42.53	55.71
	1980	1.76	0.86	2.98	3.13	8.90	1.39	39.02	91.06	149.10
Other manufacturing industries	1961	0.13	0.39	1.19	2.96	3.64	1.17	14.85	70.98	96.82
	1980	2.10	2.30	3.17	9.54	14.42	8.90	48.04	192.13	280.60
TOTAL	1961	1.06	1.37	2.50	8.84	12.25	4.85	65.42	309.37	410.89
	1980	6.16	6.00	11.63	23.48	55.54	26.44	205.59	576.82	911.70
		Relative figures (in percentages)								
Food product and beverages	1961	0.33	0.58	0.34	4.56	5.91	3.64	4.92	75.79	100.00
	1980	0.43	0.92	1.00	4.15	9.27	5.87	9.97	68.39	100.00
Textiles and ready mades	1961	0.07	0.17	0.05	0.89	1.30	0.36	19.63	77.21	100.00
	1980	0.24	0.38	0.60	1.20	4.49	1.69	31.82	59.58	100.00
Chemical products	1961	2.88	1.46	6.60	5.24	12.68	6.43	3.51	57.14	100.00
	1980	2.60	1.35	5.98	5.25	17.24	9.68	7.97	49.93	100.00
Metallurgy	1961	0.38	0.24	0.15	1.83	2.14	0.28	17.66	76.34	100.00
	1980	1.18	0.58	2.00	2.10	5.97	0.93	26.17	61.07	100.00
Other manufacturing industries	1961	0.13	0.40	1.22	3.06	3.75	1.21	15.33	73.31	100.00
	1980	0.75	0.82	1.13	3.40	5.14	3.17	17.12	68.47	100.00
TOTAL	1961	0.25	0.33	0.61	2.15	2.98	1.18	15.92	75.29	100.00
	1980	0.68	0.66	1.28	2.58	6.08	2.90	22.55	63.27	100.00

Note: The heading "non specified" and "military", whose numbers are very small have been ignored.

nel. Skilled workers are expected to increase by 140,000 in the period under review. Whereas they represented only 16 per cent of employment in the sector in 1961, they will represent almost 23 per cent in 1980. These and other smaller changes are the qualitative factors considered in the first approximations derived from the quantitative analysis described earlier.

The new occupational structure for 1980 is a considerable improvement over that of 1961. This is especially true for the top and medium-level categories the proportion of whom are to be doubled. Although the relative change for the skilled worker category does not seem very large, it is very significant in absolute terms, with an average increase in skilled workers of almost 14,000 a year, not counting replacements for normal wastage.

The forecasts for 1980 show a more rational distribution of the available trained manpower, compared with the situation in 1961. The concentration of skilled personnel in a few sectors or sub-sectors and at the same time a shortage in others is certainly one of the factors responsible for differences found in the state of development. A better distribution of these workers will help to ensure a more rational and productive utilisation of available resources for social and economic development.

3.7.2. Future trends of the present labour force

Once total manpower requirements for the various occupational categories in the target year have been fixed, and the extent to which present manpower supplies would meet them have been calculated, the difference will then represent the new manpower required during the period 1961-1980.

The manpower trend for each sector is not necessary, and in any case would be extremely difficult, since the many complex factors influencing the inter-sector mobility of workers cannot be either identified or expressed quantitatively. Estimates based on forecasts of sector product, and on productivity per worker (see paragraph 3.5.1) give only an overall idea of the changes to be expected in the breakdown of employment by sector between 1961 and 1980. These changes are fairly substantial but the migration of workers over such a long period cannot be analysed, and still less forecast in the form of intersector flows.

Although there is relatively little occupational specialisation in the less developed countries, it may be assumed that even in these countries mobility within and between sectors will be much greater than between occupations. That is, when a worker changes his job, either within the same or to another sector, this does not normally imply a change of occupational category. If this hypothesis is correct a breakdown of manpower trends by occupational category rather than by sector would be more reliable.

There are two obvious exceptions: (a) farmers migrating to urban centres usually have to accept employment as wage earners. A distinction will therefore be made between agricultural and other sectors concerning "managers, agents etc. and manual workers(1)"; (b) on the job training for manual workers. An uskilled worker may frequently become semi-skilled or even skilled, over a sufficiently long period. As the distinction between skilled, semi-skilled and unskilled workers is in any case arbitrary, the two latter categories have been made into one to simplify the problem of occupational mobility.

An examination by occupational category of the gradual fall in the present "stock" of manpower up to 1980 shows this to be attributable to:

deaths;
normal retirement;
early retirement.

The summary-tables mentioned above allow the active population to be broken down by occupational category for four age-groups. Since the number in the first age-group (up to 14) is negligible, particularly for those under 10, it has been combined with the 15-24 age-group. In 1980 the 10-24 age-group will be between 30 and 44 years of age, and the next, the 25-44 age-group, will be 45 to 64.

The survival rates officially calculated on the basis of the 1940 and 1961(2) Census were applied to these groups after adjusting the age-groups and the reference periods, and taking into account a general tendency for health to improve. The active population death rate was presumed not to differ appreciably from that for total population, and the difference between male and female death rates in the active population is so insignificant that it was disregarded. The death rates for the various occupational categories (e.g. agricultural workers and others) probably differ, but lack of information made it impossible to take this into consideration.

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(1) The great disparity in the age-composition of farmers also makes this distinction necessary.

(2) "Boletín de Análisis Demográfico", National Planning Institute, National Directorate of Statistics and Census, November 1964.

The survival rate for the 10-24 age-group was estimated at 0.863 over a period of 20 years and at 0.814 for the 25-44 age-group. The results of applying these rates to show the survivors in the 30-44 and 45-64 age-groups in 1980 are given in Table N° 3-32.

The second factor, normal retirement, affects the 45 and over age-group. Previous calculations to obtain activity rates (see paragraph 3.4) showed that the estimated number of active persons of 65 and over in 1980 is 157,500, or approximately 20 per cent of the 45-and-over age-group in 1961. This percentage was applied invariably to all occupational categories.

The third factor, early retirement, should be regarded as a correction of the second factor, affecting workers who will be between 30 and 64 in 1980. There are no statistical data regarding retirement before the normal pensionable age, but it is reasonable to assume that this will chiefly affect women who stop working because of marriage or child-birth. Consequently, this factor has been estimated on the basis of female participation in certain occupational categories. Account was also taken of the fact that female activity is increasing so that the frequency of part-time female employment will also increase.

The same table shows both the estimated results and their implications. In all, 66.3 per cent of the 1961 stock of manpower will still be alive in 1980, which means an annual decrease of 2.15 per cent, i.e. an average working life of 46.5 years. These coefficients have to be interpreted carefully, since the survival rates in each occupational category depend directly on its age-structure. Thus, we find a relatively short average working life for farmers but, on the contrary, a considerably higher survival rate for young workers outside agriculture.

Although dynamic factors are really concerned here, the method has had to be fairly static owing to the complete lack of reliable, general information about migration, the mobility of the different categories of workers between sectors and occupations,

Table 3-32

ESTIMATED NUMBER OF SURVIVORS FROM THE 1961 ACTIVE POPULATION IN 1980, BY AGE-GROUPS AND OCCUPATIONAL CATEGORIES

(absolute figures in thousands of persons)

Occupational categories	1961				1980					Survival rate 1961-1980	Annual rate of loss (%)	Average lenght of active life (years)
	TOTAL	Under 24 years	25 to 44 years	45 years and over	30 to 44 years	45 to 64 years	65 years and over	Early retire-ment	TOTAL			
Highly qualified scient. and tech. personnel	15.54	0.74	11.39	3.41	0.64	9.27	0.71	- 0.89	9.73	.626	2.4	42
Highly qualified not scient. and non-tech. personnel	72.25	11.41	44.94	15.89	9.85	36.58	3.29	- 3.60	46.12	.638	2.3	43
Intermediate	24.32	6.00	14.23	4.09	5.18	11.58	0.85	- 2.20	15.41	.634	2.3	43
Farmers	794.00	71.95	378.80	343.25	62.09	308.34	71.16		441.59	.556	3.0	33
Directors and agents (not agricultural)	42.91	3.19	23.20	16.52	2.75	18.89	3.42		25.06	.584	2.8	36
Office workers	116.39	34.26	64.67	17.47	29.57	52.64	3.62	- 10.40	75.43	.648	2.2	45
Salesmen	231.51	59.50	111.91	60.11	51.35	91.09	12.46		154.90	.669	2.1	48
Skilled manual workers												
Farmers	1.55	0.30	0.85	0.40	0.26	0.69	0.08		1.03	.665	2.1	48
Other sectors	89.90	20.76	47.41	21.72	17.92	38.59	4.50		61.01	.679	2.1	48
Semi and unskilled workers												
Agriculture (a)	733.17	370.14	253.83	109.20	319.43	206.62	22.63	- 26.57	522.11	.712	1.8	56
Other sectors (b)	870.63	354.32	369.19	147.12	300.68	298.41	30.49	- 14.74	614.84	.706	1.8	56
Military	24.30	3.62	15.87	4.81	3.12	12.92	1.00		17.04	.701	1.9	53
TOTAL (c)	3,120.80	993.06	1,368.01	759.72	857.02	1,113.56	157.47	- 58.40	2,069.65	.663	2.2	45

(a) Including family help.

(b) Including non-specified workers in the public sector.

(c) Including non-specified workers.

incentives motivating migration, the amount of female and child employment, the number of working years and the causes of retirement, and a number of other factors of vital importance when drafting an employment and human policy. In these circumstances it seemed preferable to make simple estimates rather than very refined calculations, but this does not mean that the projections should not be revised as soon as possible.

As the educational structure of the occupational categories and age-groups was known, the same procedure made it possible to calculate the composition of the survivors in 1980 by educational level. The results of these calculations are shown in Table N° 3-33.

Although these detailed calculations are very long they prove useful in view of the differences between the various categories. For instance, since uneducated employed persons are generally older than those who are educated, there will be a lower survival rate for the uneducated that the educated at the end of the period of reference.

Approximately two-thirds of the active 1961 population, i.e. 2,070,000 workers, should still be in the labour force in 1980. The estimated occupational structure for these workers was then substracted from the structure forecast for the target year for the total active population to obtain the net requirements of workers by occupational category. The next step was to determine the optimum educational profile for each occupational category; once the educational structure of survivors and new entrants during the period is known, the two component factors can be added together to obtain the future structure of the active population by occupational category and educational level.

Table N° 3-34 shows the calculation of these net requirements in thousands of persons, by occupational category.

Total requirements should be split up to show those needed to maintain the level of the original "stock" of workers and those needed to expand the labour force. As the table shows, the expansion requirements are much greater, because the growth rate of the total, and therefore, of the active, population exceeds the rate of retirement from employment. Moreover the changes in the manpower structure, made necessary by economic development, will require a redistribution of the labour force so that there will be different growth rates for economic sectors and occupational categories.

Table 3-33

ESTIMATED BREAKDOWN OF THE EDUCATION STRUCTURE OF SURVIVORS IN 1980, BY OCCUPATIONAL CATEGORIES
(in thousands of persons)

Occupational category	No education	Primary	Secondary		Others	Higher Education						Not specified	TOTAL
						Teacher training	University						
			general	technical			Pedagogic	Human Sciences	Medicine	Sciences	Technology		
Highly qualified tech. & scientific personnel	0.1	0.2	0.1	0.1				0.1	4.3	1.2	3.5	0.1	9.7
Highly qualified non-tech. and non-scientific personnel	0.2	6.0	15.6	3.3	1.0	9.8	2.6	5.9	0.2	0.4	0.6	0.5	46.1
Intermediates	0.1	5.3	5.7	0.7	2.1			0.7	0.1	0.1	0.3	0.3	15.4
Farmers	187.5	233.1	9.5	0.4	0.2			0.4		0.1	0.6	9.8	441.6
Directors and agents (not agricultural)	0.6	7.2	10.9	1.3	0.5	0.1		1.9	0.2	0.4	1.6	0.4	25.1
Office workers	0.2	17.3	40.5	9.6	2.3	0.2	0.2	3.1	0.3	0.3	0.6	0.9	75.4
Salesmen	18.1	92.5	31.6	3.5	0.7			1.2	0.2	0.3	0.7	6.1	154.9
Skilled workers	1.8	43.7	12.4	2.1	0.7			0.2			0.2	0.9	62.0
Semi and unskilled workers													
- agriculture (a)	241.8	260.1	6.2	0.8	0.1						0.1	13.0	522.1
- other sectors	98.1	424.0	58.6	6.8	4.8	0.1		0.5	0.1	0.1	0.3	21.4	614.8
Military		7.8	6.9	0.3	1.4			0.3			0.1	0.3	17.0
TOTAL (b)	548.5	1,097.2	198.0	28.9	13.8	10.2	2.8	14.3	5.4	2.9	8.6	53.7	1,984.3

(a) Including family help.
(b) Including non specified workers.

Table 3-34

ESTIMATED REQUIREMENTS FOR REPLACEMENT AND GROWTH NEEDS, AND TOTAL MANPOWER REQUIREMENTS FOR 1961-1980, BY OCCUPATIONAL CATEGORIES

(in thousands of persons)

Occupational category	Highly qualified scientific and technical personnel	Highly qualified non scientific and non technical personnel	Intermediate	Farmers Directors agents	Office workers	Salesmen	Workers		Military	TOTAL (b)
							Skilled	Semi and unskilled (a)		
1. "Stock" 1961	15.54	72.25	24.32	836.91	116.39	231.51	91.45	1,603.80	24.30	3,016.47
2. Survivors in 1980	9.73	46.12	15.41	466.65	75.43	154.90	62.04	1,136.95	17.04	1,984.27
3. Replacement needs (1-2)	5.81	26.13	8.91	370.26	40.96	76.61	29.41	466.85	7.26	1,032.20
4. Total needs 1980	55.90	193.81	146.89	1,496.35	371.31	411.22	351.60	2,615.74	34.77	5,677.59
5. Growth requirements (4-1)	40.36	121.56	122.57	659.44	254.92	179.71	260.15	1,011.94	10.47	2,661.12
6. Total requirements (3+5) = (4-2)	46.17	147.69	131.48	1,029.70	295.88	256.32	289.56	1,478.79	17.73	3,693.32

Notes : (a) Including family workers.

(b) Excluding non-specified workers consisting of various elements (unemployed, those seeking employment) not able to be forecast.

In view of the exceptional size and importance of the foregoing estimates, agriculture has been shown separately from the other sectors of the economy.

Due to the agrarian reform, farmer requirements are greater to meet expansion than replacement needs. The number of agricultural workers is increasing moderately and replacement requirements are greater than those for expansion. On the other hand, the number of non-agricultural workers will double and requirements for expansion are therefore considerably greater than for replacement.

Table N° 3-35

COMPARISON OF REPLACEMENT AND EXPANSION REQUIREMENTS IN AGRICULTURE AND OTHER FIELDS

(in thousands of persons)

	AGRICULTURAL SECTOR		OTHER SECTORS	
	Farmers	Semi- and unskilled workers (a)	Directors, agents and adminis- trators	Semi- and unskilled workers
"Stock" 1961	794.00	733.17	42.91	870.63
Survivors	441.59	522.11	25.06	614.84
Replacements	352.51	211.06	17.85	255.79
"Stock" 1980	1,391.88	875.93	104.47	1,739.81
Expansion	597.88	142.76	61.56	869.18
Total needs	950.29	353.82	79.41	1,124.97

(a) Including family help.

3.7.3. Net manpower requirements for the period 1961-1980, by occupational category and educational level

By substracting the 1961 survivors (35 per cent) from the 1980 labour force, the educational effort required became more clearly defined and the margin of error smaller in the forecasts of the educational profile for the total active population of 1980. Very few of the survivors in question will either resume formal schooling or take extramural training, so that practically two-thirds of the 1980 active population will consist of newcomers to the labour force during the plan period covered by the Report.

The educational level of new entrants to the labour force was determined by considering the following five points for each occupational category:

(a) the educational qualifications now required for each occupational category;

(b) improvements in the quality and length of training each category should receive;

(c) the educational level required by the employers, where possible;

(d) the general widening of educational opportunities and subsequent raising of the educational level of the active population; and

(e) better adaptation of the educational system to the role each occupational category will play in the economy.

The educational profiles of the active population in 1961 and of new entrants up to 1980 is shown in Table N° 3-36. A comparative analysis by occupational category will now be attempted.

Top level scientific and technical personnel

In 1961, the bulk of this category (93 per cent) were trained in the faculty of medicine (45 per cent), the faculty of engineering (37 per cent), and other scientific faculties (11 per cent). The remaining 7 per cent carried out similar work, but their training was of a lower standard, did not correspond to the job, or was unspecified.

The educational background of new entrants to this group has been confined to four educational categories only: engineering; medicine and dentistry; other scientific faculties such as biology, chemistry, etc.; and technical secondary education. The first three categories account for 97 per cent of the group.

The forecasts for medical practitioners, dentists, etc., were made on the basis of social criteria, that is of a higher ratio of doctors etc. to total population, and of a better distribution throughout the country.(1) Consequently, almost 10,000 new entrants will be required during the period, or 22 per cent of all new entrants to top level scientific and technical category. Doctors and dentists shown as teachers in the next group have also been taken into consideration when fixing the ratio of doctor: inhabitant and of dentist: inhabitant, so that a further, 1,800 must be added. No rigid distinction has been made between those in practice and those teaching medicine, since most teachers do both to some extent. Approximately one-third of medical and dental teachers are estimated to be doing full-time teaching.

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(1) See paragraph 3.7.1.

Engineers of every kind (i.e. agronomists, geologists, chemists, industrial engineers, sanitary engineers, etc.) form 37 per cent of the top-level scientific and technical category. The importance of these specialists in the development process, importance to which we have often referred in this Report, is still more apparent in industry construction and public works, and in the development of agriculture and stockbreeding. It has been assumed that the present annual growth rate, 9 per cent for engineers, will have to be at least the same as that for industry (approximately 8.5). New entrants over the whole period will total 26,500, i.e. nearly 60 per cent of all new entrants to the top level scientific and technical personnel category.

Most of the remaining professional staff to be trained, approximately 9,000, will come from the other scientific faculties, which include the natural sciences, biochemistry, chemistry, etc. This means there will be one science graduate for every three engineers. This ratio is about the same as for the active population in 1961, and seems to be justified, since it is more or less the ratio usually found in other, more advanced countries. The work of engineers is concentrated more on production, which must increase as rapidly as possible in Peru. Opportunities for importing the technologies and scientific advances already attained in other countries are still very great in Peru.

Non-scientific and non-technical professional staff

For the reasons already stated a distinction has been made within this group between teachers and others, and the number of teachers required to attain the educational target has been adjusted in the light of all the other forecasts. This group will be studied in Chapter 4 and we shall confine ourselves here to a few salient points.

In 1961 almost 53 per cent of the teachers had only a secondary education, and 13 per cent no more than a primary education. Table Nº 3-36 shows the quality of the new teachers; by 1980, some 63 per cent will have been through teacher-training and another 34 per cent will be graduates from the university faculties of education.

Two-thirds of the other non-scientific and non-technical professional staff are to be trained in the faculties of economics and commerce, law, literature, etc., while the remaining one-third should receive at least a general secondary education, possibly supplemented by some other kind of extra mural specialised training.

This in itself represents a very considerable improvement in the quality of these staff, since in 1961 only 38 per cent of them had received a higher education.

Intermediate category

This highly important category, made up of intermediate technicians and specialists of every kind, was very much behind in 1961, and formed only 0.75 per cent of the active population or barely 24,000 persons, clearly insufficient to meet the need for such staff in industry, agriculture and the services. If the training received by the persons now holding these posts is also considered, vast differences are shown to exist in their educational background: 34 per cent had only a primary education, 17 per cent completed the first half of the general secondary course, and 21 per cent the second half, less than 4 per cent completed technical secondary education and 9 per cent received a higher education. Doubtless intermediate posts exist which account for the present hidden demand, but many of these are held by workers with inadequate training (see paragraph 3.6.2). The increase over the period under review should, therefore, be qualitative as well as quantitative.

The quantitative target is an annual increase of 10 per cent, or a total of 132,000 new entrants by 1980.

As far as quality is concerned, various forms of training will be provided: 33 per cent will graduate from technical secondary education; 11 per cent will receive post-secondary training from intermediate-level institutions such as the regional colleges planned to provide this type of training; and 40 per cent from "other education", half in school and half in extra-mural centres. This will leave

Table 3-36

EDUCATIONAL CHARACTERISTICS OF THE 1961 ACTIVE POPULATION AND OF NEW WORKERS FROM 1961 TO 1980 BY OCCUPATIONAL CATEGORIES

(in relative figures)

Educational level / Occupational category		No education (a)	Primary	Secondary			Inter-mediate	Other education		Higher education						Not specified
				General		Technical		In School	Out of School	Teacher training	University					
				1st cycle	2nd cycle						Education	Humanities	Medicine	Science	Engineering	
Highly qualified scientific and technical personnel		1.16	1.88	0.45	1.03	0.42		0.33		0.10	0.13	0.88	45.00	11.18	36.70	0.64
Highly qualified non scientific and non technical						3.20							21.60	17.60	57.60	
- Teachers	1961	0.11	12.65		36.82	3.34		1.65		27.67	7.27	6.40	0.59	0.93	1.39	1.18
New	1961-80				1.67	1.00				63.21	8.70	10.36	2.34	10.04	2.68	
- Others	1961	1.25	17.01		20.03	16.60		3.50		1.86	0.83	36.14	0.44	0.57	0.57	1.20
New	1961-80				34.65						9.90	55.45				
Intermediate	1961	0.70	34.20	16.71	20.67	3.95		12.82		0.06	0.25	4.88	0.95	0.90	0.91	2.00
New	1961-80		3.09		12.92	33.16	10.67	20.08	20.08							
Directors and administrators																
- Not in agriculture	1961	2.18	29.74	13.45	29.73	4.74		1.88		0.59	0.19	7.30	0.86	1.24	6.11	1.99
New	1961-80		6.05		44.64	7.91						33.02		5.12	3.26	
- In agriculture	1961	47.35	47.96	1.19	0.88	0.09		0.03		0.01		0.08	-	0.01	0.12	2.28
New	1961-80	15.55	60.15		20.60	3.58						0.04			0.08	
Office workers	1961	0.38	24.55	18.91	34.35	11.44		2.85		0.24	0.24	4.14	0.38	0.39	0.79	1.34
New	1961-80		15.86		67.42	9.98		3.37	3.37							
Salesmen	1961	13.55	58.75	10.02	9.27	2.00		0.41		0.05	0.03	0.77	0.12	0.20	0.43	4.40
New	1961-80	2.88	47.55		33.57	2.31		6.84	6.85							
Skilled workers	1961	3.85	71.51	12.83	5.71	2.86		1.11		0.02	0.01	0.26	0.07	0.04	0.22	1.51
New	1961-80		52.93			15.31			31.76							
Semi and unskilled workers																
- Not in agriculture	1961	19.04	65.79	6.59	2.28	0.97		0.75		0.02	-	0.09	0.01	0.01	0.05	4.49
New	1961-80	9.49	90.51													
- In agriculture	1961	46.52	49.34	0.97	0.26	0.14		0.01							0.01	2.75
New	1961-80	39.25	60.75													
Military	1961	0.23	47.75	22.67	16.24	1.32		7.97		0.08	0.08	1.52	0.16	0.12	0.21	1.65
New	1961-80		52.08		22.92			25.00								
TOTAL STOCK	1961	30.48	52.63	5.10	4.41	1.30		0.65		0.53	0.15	0.78	0.30	0.14	0.44	3.09
New	1961-80	10.85	58.08	2.43	12.53	0.38		1.46	4.07	1.89	0.36	1.59	0.34	0.63	0.89	

(a) The 1961-80 newcomers include drop outs from primary education

(b) Includes family help

a small group without any technical training, some of whom will have a general secondary education and just a few with only a primary education.

Directors, managers and administrative personnel

This category has been divided into two parts to separate the "small farmers", cultivators of holdings in rural and suburban zones and for whom the government's agrarian reform and land settlement programmes are mainly intended.

In spite of industrialisation and the migration of agricultural workers to industry, the normal increase for this group should provide almost one million new entrants to the labour force during the period covered by this Report. The educational level of this group was extremely low in 1961: 47 per cent had received no education of any kind and 48 per cent had attended primary school for all or part of the course.

A tremendous training task will be needed to provide instruction for at least 950,000 new self-employed farmers between 1961 and 1980. In the circumstances, not more than 30 per cent of these will graduate from secondary school and, however great the effort, there will still be some without any - or with an uncompleted - primary schooling at the end of the period. It must be remembered that four years have already elapsed since 1961 and that, during these four years, a number of workers who had no, or very little education have entered the labour force.

Technical farming education will account for another 34,000 workers in this category; this figure, which represents not quite 4 per cent, was almost insignificant in 1961; in addition many of those graduating from technical secondary agricultural schools will be in the public sector, working in the agricultural information service, so that it is, in fact, fairly optimistic.

The second part of this "director, manager and administrative" category showed a relatively low level of education. This is due to at least two factors: the many family undertakings which do not employ professional managers or directors, and the large number of small firms of all kinds which increase the weight given to the small proprietors. This category, however, will play a very important part in the future of commerce and industry, and its educational level must improve if it is to introduce modern techniques to increase its efficiency. The numerous small undertakings will doubtless remain in existence for a long time to come, especially in commerce, but the trend to consolidate will continue.

More than 40 per cent of this group is expected to receive university training by 1980. The largest proportion (33 per cent) will come from the faculties of economics and commerce, law, etc. About 8 per cent are expected to graduate from technical secondary education and will go into the repair of vehicles and durable consumer goods, or any of the various medium-sized manufacturing firms.

Office workers

The expansion of commercial, government and other activities in all their forms will require a staff of subordinate workers able to perform administrative duties efficiently. Whereas 25 per cent of these workers had received only a primary education in 1961, the proportion of this level among those entering employment between 1961 and 1980 will be no more than 15 per cent; 67 per cent of the new entrants (mainly those in commerce) will graduate from general secondary education and another 10 per cent from technical secondary education. Another 20,000 (or 7 per cent) will have received further training, either in or out of school.

Sales personnel

This group, which is very important for industry and the marketing of industrial products, will need to be strengthened both qualitatively and quantitively. In 1961, only 18 per cent of these workers said they had completed secondary education. Most of the illiterate persons in the group were obviously among the itinerant salesmen, who usually engage in this trade for want of better opportunities. Thus the proportion of new entrants with at least complete general secondary education should go up to 50 per cent.

Skilled workers

The need for suitable training for this category, which plays such an important part in industrial development, increases as industrialisation advances.

In 1961, the only education that 75 per cent of these workers had received was part or all of the primary course, and the amount of vocational training was also very small. Less than 3 per cent had attended technical secondary school. Their technical training must, therefore, have consisted mainly of practical on-the-job training. It is also for this reason that the absolute number was so small in 1961, only 91,000 out of a total active population of more than 3 million.

In view of the effort required to train an average of 15,000 new entrants a year, it is probable that there will still be half of them who enter the labour force with only a primary education, especially if we include those who have entered since 1961. Some 44,000 are expected to graduate from technical secondary school and twice this number (or 32 per cent of the new entrants) will have to receive practical training or instruction outside school, either through training programmes organised by their firms or under special schemes. In spite of the very rapid development of technical secondary education, the country will have an enormous task if it is to meet the tremendous increase in the requirements for skilled workers in the coming years. The out-of-school training of skilled workers becomes increasingly important, for example, such a training programme as that planned by the National Apprenticeship and Industrial Employment Service (SENATI), which is to be extended to the entire country. Similar programmes for training skilled workers have been very successful in other Latin American countries.

Semi-skilled and unskilled workers

In the same way as the "director, manager and administrative personnel" category, which includes small farmers, was split up into two parts, so this group has been divided in order to permit separate treatment of agricultural workers. The latter, as shown in Table N° 3-36, had an illiteracy index of almost 50 per cent in 1961. Education should try to provide a complete primary schooling for 60 per cent of the new entrants to the labour force in rural areas. In fact, the shortcomings of compulsory education in 1961, which can be overcome only in the long run, and the early leavers from primary school, who are still numerous, will mean that 40 per cent of the newcomers to this category will not have received a complete primary education.

The educational level of non-agricultural workers was very different in 1961, only 19 per cent of whom had received no education whatsoever. The target of complete primary education for 90 per cent of new entrants is rather ambitious, but is based on the fact that this category is concentrated in the urban areas where educational opportunities are better. The remaining 10 per cent will be unable to complete primary education for the same reasons as those given for agricultural workers.

Table N° 3-37 uses the same data as Table N° 3-36, but in reference to the entire labour force and not to each occupational category; the educational structure of the 1980 active population can then be compared to that of 1961 (see Table N° 3-25).

The educational level of almost all the new entrants to the professional categories will correspond to the teacher training or university level, whereas in 1961 there were only 66 per cent. Only two-thirds of the active population had received education of any kind in 1961, whereas 90 per cent of the new entrants will have completed at least primary education.

Table N° 3-38 shows survivors from the 1961 labour force plus new entrants between 1961 and 1980; it uses the same overall figures as Table N° 3-29 (occupational categories by economic sector), but shows the respective educational levels.

The educational level of the total labour force in 1980 is somewhat lower than that of the new entrants, since the former includes the survivors from 1961, whose level was, of course, much lower than that of the new entrants.

A comparison of the 1980 and 1961 educational structures for the active population brings out some very significant changes.

First, there will be only a very small proportion of workers who will not have a complete primary education, and 549,000 of these (or almost 60 per cent) are survivors from 1961. In any case, many of them, though not receiving a formal schooling, will be catered for by the literacy programmes and the agricultural information services, thus improving their occupational skills and their cultural level.

The proportion of the active population with a complete primary education will increase substantially, for those who attain a higher level of education must already have completed a primary education, and the proportion they form of the total active population is much greater.

At secondary level, 18 per cent of the workers will have a secondary education, compared with only 12 per cent in 1961.

Table 3-37

EDUCATIONAL STRUCTURE OF THE NEWCOMERS TO THE ACTIVE POPULATION BETWEEN
1961 AND 1980 BY OCCUPATIONAL CATEGORIES

(as percentage of the total)

Educational level / Occupational category	No education (a)	Primary	Secondary			Inter-mediate	Other education		Higher education						TOTAL
			General		Technical		In school	Out of school	Teacher training	University					
			1st cycle	2nd cycle						Education	Humanities	Medicine	Science	Engineering	
Highly qualified scientific and technical personnel					0.04							0.27	0.22	0.72	1.25
Highly qualified non-scientific and non-technical personnel															
- teachers				0.05	0.03				1.89	0.26(b)	0.31	0.07	0.30	0.08	2.99
- others				0.35						0.10	0.56				1.01
Intermediates		0.11	0.20	0.26	1.18	0.38	0.71	0.72							3.56
Directors and administrators															
- in agriculture	4.00	15.48	0.30	5.00	0.92			0.01						0.02	25.73
- others		0.13	0.08	0.88	0.17						0.71		0.11	0.07	2.15
Office workers		1.27	1.21	4.19	0.80		0.27	0.27							8.01
Salesmen	0.20	3.30	0.60	1.73	0.16		0.48	0.47							6.94
Skilled workers		4.15			1.20			2.49							7.84
Semi and unskilled workers															
- in agriculture	3.76	5.82													9.58
- others	2.89	27.57													30.46
Military		0.25	0.04	0.07				0.12							0.48
TOTAL (%)	10.85	58.08	2.43	12.53	4.50	0.38	1.46	4.07	1.89	0.36	1.59	0.34	0.63	0.89	100.00
Thousands of persons	400.73	2,145.08	89.75	462.77	166.20	14.03	53.92	150.32	69.80	13.30	58.72	12.56	23.27	32.87	

(a) Including primary school drop outs.

(b) Part of the teachers are shown under the headings "Humanities" and according to specialisation.

Table 3-38

EDUCATIONAL STRUCTURE OF THE ACTIVE POPULATION IN 1980, BY OCCUPATIONAL CATEGORIES

(relative figures)

Educational level / Occupational category	No education (a)	Primary	Secondary		Interme-diate	Other education		Higher education						Not specified	Total (%)	Total in thousands of persons
			general	technical		In school	Out of School	Teacher training	Education	Humanities	Medicine	Sciences	Engineering			
Highly qualified scientific and tech. personnel			0.01	0.03						0.01	0.25	0.16	0.53		0.99	55.9
Highly qualified non-scientific and non-technical personnel																
- teachers		0.06	0.26	0.04		0.01		1.40	0.21	0.21	0.05	0.20	0.06	0.01	2.51	142.5
- others		0.04	0.27	0.04		0.01		0.01	0.07	0.46					0.90	51.3
Intermediates	0.01	0.16	0.40	0.78	0.25	0.50	0.46			0.01			0.01	0.01	2.59	146.9
Directors and administrators																
- in agriculture	5.90	14.18	3.61	0.60		0.02				0.01	0.01	0.01	0.02	0.15	24.52	1,391.6
- others	0.01	0.21	0.82	0.13		0.01				0.50	0.01	0.08	0.07		1.84	104.5
Office workers		1.13	4.23	0.69		0.22	0.18			0.05		0.01	0.01	0.02	6.54	371.3
Salesmen	0.45	3.78	2.07	0.17		0.32	0.31			0.02			0.01	0.11	7.24	411.2
Skilled workers	0.03	3.47	0.22	0.82		0.01	1.62							0.02	6.19	351.6
Semi and non skilled workers																
- in agriculture (b)	6.71	8.37	0.11	0.01										0.23	15.43	875.9
- others	3.61	25.40	1.03	0.12		0.08				0.01			0.01	0.38	30.64	1,739.8
		0.30	0.19	0.01		0.01	0.08			0.01				0.01	0.61	34.8
TOTAL (%)	16.72	57.10	13.22	3.44	0.25	1.19	2.65	1.41	0.28	1.29	0.32	0.46	0.73	0.94	100.00	-
(Total in thousands of persons)	949.2	3,242.3	750.4	195.1	14.0	67.7	150.3	80.0	16.1	73.1	18.0	26.2	41.5	53.7		5,677.6

(a) Including primary school drop-outs.

(b) Includes family help.

The number of workers with higher education, vitally necessary for economic and social progress, will increase considerably between now and 1980, rising from 2.2 per cent in 1961 to 4.5 per cent in 1980, or, in absolute figures, 255,000 professional workers compared with barely 70,000 in 1961.

The quality of the structure of top level staff is just as important as numerical strength. The ratio of scientific or technical graduates to those from the humanities was 59 : 100 in 1961 and should be 76 : 100 in 1980. An improvement in the quality of technical training will also be found at secondary level, especially out-of-school training.

Finally, to illustrate the changes in the educational level of each occupational category by a single figure, we have calculated (see paragraph 3.6.3) an approximate index of the average number of shool years completed by each of the categories in 1961 and 1980. The results appear in Table N° 3-39.

Table N° 3-39

COMPARISON OF THE AVERAGE NUMBER OF SCHOOL YEARS COMPLETED BY THE ACTIVE POPULATION IN 1961 AND 1980

OCCUPATIONAL CATEGORIES	1961	1980
Top level scientific and technical	13.6	16.3
Top level non-scientific, non-technical	10.2	14.4
Intermediate	7.9	9.7
Directors and managers (non-agricultural)	7.2	12.2
Farmers	1.5	5.4
Office workers	8.2	10.0
Sales personnel	4.3	7.4
Skilled manual workers	4.5	7.1
Semi-skilled and unskilled workers		
- in agriculture(1)	1.5	3.4
- in other sectors	3.3	5.5
TOTAL	3.1	6.3

(1) Includes family workers.

The average number of years' education for the active population will increase from 3.1 to 6.3 years. Skilled workers, whose average number of school years was only a little over the first primary cycle, will average one year more than the complete primary course in 1980. The great expansion in rural education is shown by the figure for small independent farmers who averaged only 1.5 years' education in 1961, but by 1980 should average almost the complete primary course.

Teachers represent another extremely important category for education; although, in this table, they are included among the top-level non-scientific and non-technical staff, in other parts of the Report they are shown separately. In 1961, the average number of years' education was higher for teachers than for other non-scientific and non-technical staff, and will also be higher in 1980, by nearly one year. The university degrees of scientific and technical personnel who are professors in the faculties of science, medicine and engineering require more years of study than do those graduating in education.

To resume: substantial changes must be made if the economic and social development targets are to be attained. The gearing of education to these changes will ensure not only the link-up between the various educational levels but also between education and the economy as a whole.

Table 3-40

COMPARATIVE BREAKDOWN OF THE ACTIVE POPULATION, BY OCCUPATIONAL CATEGORIES,
IN SELECTED MEDITERRANEAN COUNTRIES AND IN PERU (Base year and target year)

Occupational category	Spain		Greece		Portugal	Italy		Peru (e)	
	1960	1975	1960	1975	1960	1960	1975	1960	1980
Highly qualified scientific and technical personnel	1.1	1.3	0.9	1.2	0.6 (a)	5.0 (b)	8.3 (b)	0.5	1.0
Other highly qualified personnel	2.4	3.4	2.5	3.1				2.4	3.4
Intermediates	0.7	1.8	1.4	2.1	0.9	3.4	9.8	0.8	2.6
Directors and agents	1.0	2.0	0.5	0.7	1.1			1.4	1.9
Office workers and salesmen	12.1	16.8	12.5	16.1	7.3	11.6	18.5	11.6	13.9
Farmers, fishermen, etc.	41.7	27.4	52.2	38.5	44.9	29.7	18.1	26.5	24.7
Skilled workers	8.4	11.6	8.5	10.6	1.1	1.0	3.5	3.1	6.2
Semi and non skilled workers	19.9	20.2	21.5	27.7	44.1	49.3	41.8	53.7 (d)	46.3 (d)
Service workers	12.7	15.5	(c)	(c)	(c)	(c)	(c)	(c)	(c)
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

(a) Including other than scientific and technical personnel.

(b) Including other than scientific and technical personnel and directors and agents.

(c) Service workers are included in the other worker categories.

(d) Including family help in agriculture and most of the fishermen employed in the anchovy industry.

(e) For the comparison, the data concerns active civil population only.

Chapter 4

PROSPECTS OF EDUCATIONAL EXPANSION UP TO 1980

In this chapter an attempt is made to project the long-term expansion of education on the basis of manpower requirements for Peru's social and economic development. Although it is obviously not possible to foresee exactly how the educational system will develop in future a general idea can be obtained which will allow policy lines to be drawn and projects to be made for the expansion of education.

We shall see that, as the different sections of the educational system are mutually dependent on each other and are functioning under increasingly complex conditions, any educational policy must avoid all partial measures or solutions which do not take into account possible repercussions on other parts of the educational system or even on society or the economy at large.

An integral view of the education system necessarily implies a long-term view, since reforms often require some time to produce tangible results. Even so, a long-term view of this kind should not exclude the immediate tasks of educational development; on the contrary, it should permit the drafting of consistent short and medium-term policies whose longer-term effects would be taken into consideration.

The projection method used consists of the following steps:

1. Express manpower needs in terms of education requirements, i.e, as the number of graduates to be produced for the various levels and branches of education during the period of reference;
2. On the basis of these objectives, decide the numbers to be enrolled for each level and branch;
3. Determine the number of teachers required for the expansion and improvement of education;
4. Make a financial estimate of the cost of the required expansion to see whether the economy was able to meet it.

4.1. Quantitative objectives of educational development

The traditional conception of the social function of education often interprets educational targets in terms of the total enrolment desirable at each educational level. The quantitative objectives are projected on the basis of international comparisons or recommendations, preferably completed by an estimate of the financial possibilities for the target year. They are expressed in the form of school enrolment rates for certain more or less arbitrarily defined age-groups.

The discussion in Chapter 2 on the productivity of education has already shown the uncertainties and deficiencies inherent in this narrow definition of educational targets. The purpose of education is certainly not to get the largest possible number of children in certain age-groups to school, regardless of the results and of the efficiency and the usefulness to the individual and to society of the instruction given.

Although, for compulsory education, these general objectives may be suitable as a basis for starting to plan, even at this level, which is the only one attained by the great majority of the population and which absorbs a considerable proportion of the financial resources, efficiency cannot be based solely on enrolment rates.

For secondary and higher education, relatively more varied and more expensive, the need is imperative. Targets here must be based on the actual need for skilled workers or, what amounts to the same thing, the jobs available to persons graduating from these levels. Consequently, quantitative targets should be expressed in terms of the number of graduates rather than of students enrolled who may or may not complete their studies. The number of entrants and total enrolment can then be calculated from the number of graduates, as can the type and size of the resources required.

Although the educational objectives are necessarily established on the basis of socio-economic needs and opportunities some persons also study for other than vocational reasons i.e. a person may wish to:

1. Enter gainful employment;
2. Undertake advanced studies;
3. Be inactive, i.e. chose neither employment nor study.

Each factor must be considered when determining the total number graduating from the various levels over a given period. The limited information available has made it necessary to treat persons enrolled in the final grade as graduates. There is little risk of error in doing this since most of those in the final grade do graduate (either immediately or a year or so later) and, in any case, their level is high enough to influence their choice of occupation and to allow them much the same range of choice as graduates. This question is important enough to warrant mention and to justify additional and more thorough research, especially for occupational careers.

To give an example, the number of graduates from ordinary secondary education entering employment was estimated (see chapter 3) at some 462,800 for the period 1961-1980. To these must be added the number of those going on to and completing higher education, those who drop out being included in the 462,800 (since they are secondary graduates only). The number of drop-outs is not yet known but can be estimated by substracting the number of graduates from the period of reference. Mathematical verification shows discrepancy becomes smaller as the "pass rate" increases towards the end of the period.

The third factor, inactivity, may be expressed by a "rate of participation" in both occupational activity and further study. Since there is no statistical information about this(1) we can offer only working hypotheses. It seems reasonable to assume that two factors should be considered: the proportion of women graduates in the various types of education, and the extent to which these different branches are vocational in nature. Table N° 4-01 shows

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(1) This does not mean the average rates of activity and school enrolment used hitherto, but rather marginal coefficients concerning new employees or students (as the case may be) over the period.

Table 4-01

REQUIREMENTS FOR QUALIFIED PERSONNEL, BY EDUCATIONAL LEVEL, 1961-1980

(in thousands of persons)

Educational level	Required by the economy	Continue their studies a/	Rate of activity	Total needs of qualified personnel	Non active
	(a)	(b)	(c)	($d = \frac{a+b}{c}$)	($e=d-(a+b)$)
Primary	2,145.1	1,840.0	0.71	5,582.5	1,597.4
Secondary					
- General	462.8	259.4	0.65	1,111.0	388.8
- Technical	166.2	38.2	0.95	214.4	10.0
Intermediate	14.0	0.2	0.95	14.9	0.7
Higher					
- Teacher training	69.8	-	0.78	89.9	20.1
- Institutes of Education					
- Arts and Sciences b/	95.4	-	0.78	122.5	27.1
- Technology	32.9	-	0.90	36.4	3.5
- Medicine	12.6	-	0.93	13.6	1.0

Notes : a/Including those who continue and effectively complete their studies later during the period 1961-80.

b/Combined for the purpose of this study, since students in institutes of education also take courses in the arts and science faculties (see Tables 3-38 and 4-03).

the participation rates thus estimated by educational level.

For general secondary education, the participation rate is estimated at 0.65, i.e. that an average of 65 out of every 100 graduates will enter employment or continue their education, while 35% will do neither. This relatively low rate implies a growing female participation in this type of education, since if half the graduates are women a participation rate of approximately 40 per cent for women would require a rate of 90 per cent for men to give an overall rate of 65%. On the other hand, a much higher participation rate is estimated for graduates from technical secondary education since there are fewer women and the students are prepared directly and specifically for clearly defined vocational activities. The rate for those leaving primary education is slightly higher than that estimated for general secondary education, since it is assumed that a substantial number will go on to secondary school and that most of the rest will want - and need - to take up gainful employment. The same reasoning was used when the rates for the various branches of higher education were calculated. These rates were relatively low for graduates from the teacher training institutes and from education and humanity faculties, and higher rates for medical, scientific and engineering graduates. The educational authorities should therefore try to discourage the present trend among graduates in these branches of either continuing their studies or of leaving Peru for good.

In short, to calculate the total number of secondary graduates required, the number needed by the economy was added to the total number of graduates from higher education (account being taken of the participation rates) this total then being divided by the participation rate for secondary education, to allow for the "inactive persons". Table N° 4-01 summarises these calculations for all levels. The fact that a small number of persons entering higher education come from technical secondary education creates some difficulty. Information is lacking, but so far these numbers have been small. With the extension of educational opportunities and to meet the growing demand for highly skilled technical personnel, however, the proportion is expected to rise in future.

As students in institutes of Education attend the science and humanity faculties (see paragraph 4.3.3.) for their specialisations, they have been allocated proportionally to these faculties, as they were in Table N° 3-38 for the same reasons.

Once the overall output targets by educational level have been fixed, a breakdown must be made by branch or type of education. This has been done for technical secondary education, where a breakdown of this kind is very important. Although the proportion of graduates from general secondary evening and night classes is only 2 per cent of the total, an expansion is expected in view of the keen social demand from persons already gainfully employed. Without belittling the opportunities offered by part-time education, we feel the educational authorities should make sure that standards do not fall below those of full-time education.

The technical secondary graduates needed will have to be split up into three types: agricultural, industrial and commercial, according to requirements. Although no detailed estimates of these needs have been prepared, the manpower claculations in the preceding chapter can be used as a guide. As a starting point it was decided to use the estimated expansion for certain occupational categories (technicians and skilled workers in industry and office workers) which correspond very closely to the different types of technical training. Obviously a radical change in the present trend of these branches is not possible; productivity has been, and still is very low, and most of the graduates are not doing the specific job for which they were trained. In these circumstances it is very difficult to set suitable and realistic development targets. Table N° 4-02 shows that technical, agricultural and industrial education will be expanded most, with a relatively smaller expansion for commercial. The most urgent matter for attention in technical education is not an increase in numbers but a basic reform in the quality so as to produce the properly trained technicians required. In the meantime, private out-of-school training will be the only real means of training these technicians.

Table N° 4-02

TECHNICAL SECONDARY GRADUATES BY BRANCH : TOTAL NEEDS AND RECENT OUTPUT

(absolute figures in thousands of persons)

Branch	1961-64		1961-80 (a)	
	Total recent output	%	Total requirements	%
Technical secondary-Total	15,9	100,0	214,4	100
Agricultural	2,2	13,9	42,5	20
Industrial	7,8	48,7	107,1	50
Male	4,4	27,5	64,3	30
Female	3,4	21,2	42,8	20
Commercial	6,0	37,4	64,6	30
Day classes	5,5	34,6	57,6	27
Evening and night classes	0,5	2,8	7,0	3

(a) According to projections of needs.

The next methodological step was to spread the total graduate requirements for each level and branch over the years 1961 to 1980. To do this, the period was split up into three parts: 1) from 1961 to 1964, for which the number of graduates is already known; 2) A period varying according to the length of the course concerned. As the number of students is known, the number of graduates in the next four or five years can be estimated on the basis of expected pass rates. 3) The remaining needs have been distributed over the third part of the period to obtain a gradual increase.

Table N° 4-03 shows a breakdown into four sub-periods(1) of the total number of graduates needed. Certain adjustements were made to the flow of graduates to eliminate any inconsistencies; for example, the number of secondary graduates in any school year cannot be lower than that of admissions to higher education the following year. Flows have also been corrected to eliminate abrupt changes in continuation rates from one level to another. Planning necessarily uses fairly rigid models and results must be checked

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(1) These do not correspond to the three periods mentioned above, but to the period used in the plans, e.g. the second corresponds to the four-year period of the national plan now under preparation.

Table 4-03

TOTAL REQUIREMENTS FOR QUALIFIED STAFF, BY PERIOD, LEVEL, AND EDUCATIONAL BRANCH
1961 - 1980

(in thousands of persons)

LEVEL AND BRANCH OF EDUCATION	1961-1980	1961-1966	1967-1970	1971-1975	1976-1980
TOTAL	7,185.6	988.3	1,097.2	2,188.8	2,911.3
PRIMARY	5,582.5	768.0	832.1	1,711.4	2,271.0
SECONDARY	1,325.5	171.6	209.6	398.3	546.0
- GENERAL SECONDARY a)	1,111.1	145.6	176.4	333.6	455.5
- TECHNICAL SECONDARY	214.4	26.0	33.2	64.7	90.5
- AGRICULTURAL	42.5	3.9	6.8	13.6	18.2
- INDUSTRIAL	107.1	12.3	15.2	31.3	48.3
- boys	64.4	6.8	8.2	18.4	31.0
- girls	42.7	5.5	7.0	12.9	17.3
- COMMERCIAL	64.8	9.8	11.2	19.8	24.0
- full-time course	57.7	8.9	10.1	17.5	21.2
- evening classes	7.1	0.9	1.1	2.3	2.8
- INTERMEDIATE	15.0	0.1	2.0	5.7	7.2
- HIGHER	262.6	48.6	53.5	73.4	87.1
- TEACHER TRAINING	90.0	15.0	16.4	27.1	31.5
- UNIVERSITIES	172.6	33.6	37.1	46.3	55.6
- Institutes of education	36.7	10.6	9.9	9.0	7.2
- Humanities	59.6	11.3	15.3	16.3	16.7
- Medicine	13.7	2.5	2.1	3.6	5.5
- Sciences	26.1	2.9	3.1	6.9	13.2
- Technology	36.5	6.3	6.7	10.5	13.0

Note : a) full-time courses only.

at each stage for the sake of logic and consistency, without pretending, however, to prophesy the future - which, anyway, is not the purpose of planning.

4.2. Projections of school population by level and branch of education.

Once the target for the number of graduates is known, school population trends can be calculated using a series of pass rates showing the ratio between the numbers enrolled at the various levels and the numbers graduating. In Chapter 2 these ratios were calculated for each level and branch for 1961 to 1964, the number of first-year enrolments always being 100/100. Education being static by nature, no drastic short-term changes are expected, and the previous rates may therefore be used to determine the next flow of the students now enrolled. Final-year enrolment for the next few years thus calculated, for example, for a five-year course. The proportion of the students who enrolled in 1964 and who are still at school in 1968 can be estimated.

A marked improvement in educational productivity, with a progressively rising pass rate, can be expected only over a longer period. A different method was adopted for primary schools, it being considered that, as this level of education becomes general, the serious difference between the actual, and what should be the normal age for each class must necessarily disappear. First-year enrolment was therefore estimated on the basis of the seven-year old population, by means of a special coefficient anticipating a substantial improvement in the pass rate for compulsory education. Under these conditions, the age-spread of the pupils in the same class will be smaller. Schools flows can then be worked out for each class on the basis of the percentage enrolled for each age.

For nursery schools, very general projections have been made based on population trends for the 3 to 6 year age group. To ensure consistency between school flow projections for all levels and branches, certain hypotheses were laid down concerning the age-structure of the school population; thus overall enrolment rates for five-year age-groups were calculated, as well as continuation coefficients from one level to another.

The method used confirms that long-term forecasts must be used to project educational expansion owing to the particular organisation of educational services, and the length and linking-up of the various courses and cycles.

4.2.1. First-year enrolment trends up to 1966

Table N° 4-04 shows estimated first-year enrolment trends for 1964 to 1966, by level and branch. Although the Programm of Public Investments, already approved by the government, covers these years, its forecasts did not include specific first-year enrolment targets, so that estimates are needed to fix the exact targets as from 1967 (the first year covered by the 1967-1970 Economic and Social Development Plan, now under preparation).

The exceptionally high growth rate in primary education in 1964 is not expected to increase further in 1965 and 1966, mainly because the growth targets for this level depend chiefly on the creation of teaching posts, and not on a first-year enrolment policy. The total increase between 1964 and 1966 is expected to be about 6 per cent.

First-year capacity in general secondary education, on the other hand, has been expanded to cope with the larger numbers coming from primary education, so that an overall expansion of approximately 20 per cent has been estimated for 1964 to 1966; the increase for evening and night classes is expected to be slightly higher.

The estimated growth rate for technical secondary education is slightly higher than for general secondary education, because of the large number of technical secondary schools established in recent years. Boys' agricultural and industrial branches are developing much more rapidly than the girls industrial branches or the commercial branches.

The estimates of first-year enrolment in intermediate education have taken into account the opening of new Schools for Agricultural Experts, and will go from 400 in 1964 to 700 in 1966.

In 1966, first-year primary teacher-training is expected to remain stable at 6,800, for the recent very rapid growth rate would be difficult to keep up.

University education, however, is likely to go on expanding rapidly. Growth will be about 44.6 per cent between 1964 and 1966 for science and the humanities, and slightly below the average for medicine and education; engineering will be only 8.3 per cent.

Table 4-04

FIRST-YEAR ENROLMENT TRENDS (1964-66) BY LEVEL AND BRANCH OF EDUCATION

(thousands of pupils)

LEVEL AND BRANCH OF EDUCATION	1964	1966
TOTAL	725.0	785.8
PRIMARY	595.7	630.7
SECONDARY	112.0	133.6
- GENERAL SECONDARY	88.2	104.6
- full-time classes	77.7	90.8
- evening classes	10.5	13.8
- SECONDAIRE TECHNICAL	23.8	29.0
- AGRICULTURAL	2.8	3.8
- INDUSTRIAL	10.2	12.7
- boys	5.6	7.0
- girls	4.6	5.7
- COMMERCIAL	10.8	1.5
- full-time classes	5.9	0.0
- evening classes	4.9	5.5
INTERMEDIATE	0.4	0.7
HIGHER	16.9	21.4
- TEACHER TRAINING (a)	6.8	6.8
- UNIVERSITIES	10.1	14.6
- Institutes of education (b)	2.9	3.8
- Arts	3.6	5.6
- Arts (4)	1.3	3.5
- Arts (5)	2.3	2.1
- MEDICINE	0.7	1.0
- medicine (4)	0.2	0.3
- medicine (5)	0.5	0.7
- SCIENCE	0.5	1.6
- TECHNOLOGY	2.4	2.6

(a) Primary-teacher training only. Training Colleges for general secondary and physical training schools are shown under the heading "Institutes of Education".

(b) Including some arts students who intend to become teachers.

These various trends merely reflect the changes analysed in Chapter 2, but will influence the number of graduates over the next four eight years, according to the lenght of the courses(1)

4.2.2. Hypothetical pass rates for 1970, 1975 and 1980

Pass rates, in spite of the part they play in the development of education, have not so far received the attention they deserve. Chapter 2 showed any improvement to be almost negligible and the level to be extremely low - level which, paradoxically enough, shows the standard of education to be low and the cost per graduate to be high.

Here, there is no question of estimating the trend of pass rates but rather of clearly defining a policy and targets which will make possible an improvement in the productivity of the educational system. The fact that a higher pass rate implies a higher educational standard and hence a higher cost per pupil but a lower cost per graduate brings out the strategic importance of these targets.

Table N° 4-05 shows hypothetical pass rates established for the purpose of this report. Considerable improvements are estimated, ranging from 50 per cent for commercial evening and night classes to 85 per cent for primary teacher-training. A significant improvement in the pass rate is possible only after a number of years, and the greatest increase is expected between 1970 and 1975.

In general, the higher the pass rate, the more difficult it is to improve it, and the longer the course or cycle the lower the pass rate will be. Finally, the pass rate will be higher the more vocationally slanted the course and the stricter the selection of the students. On the other hand, opportunities for partial certification or for placement before the completion of a course will cause the pass rate to fall.

The estimated pass rate for primary education is 70 per cent; this is relatively high but can be justified since this level is elementary and compulsory, and is intended for every one.

Slightly lower pass rates may be projected in secondary education, but a substantial improvement is likely in the productivity of technical secondary education where the rate should rise from under 40 to reach over 60 per cent.

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(1) This means there cannot be any substantial increase in the number of graduates over the period covered by the Economic and Social Development Plan, 1967-1970, since all this age-group is already enrolled.

Table 4-05

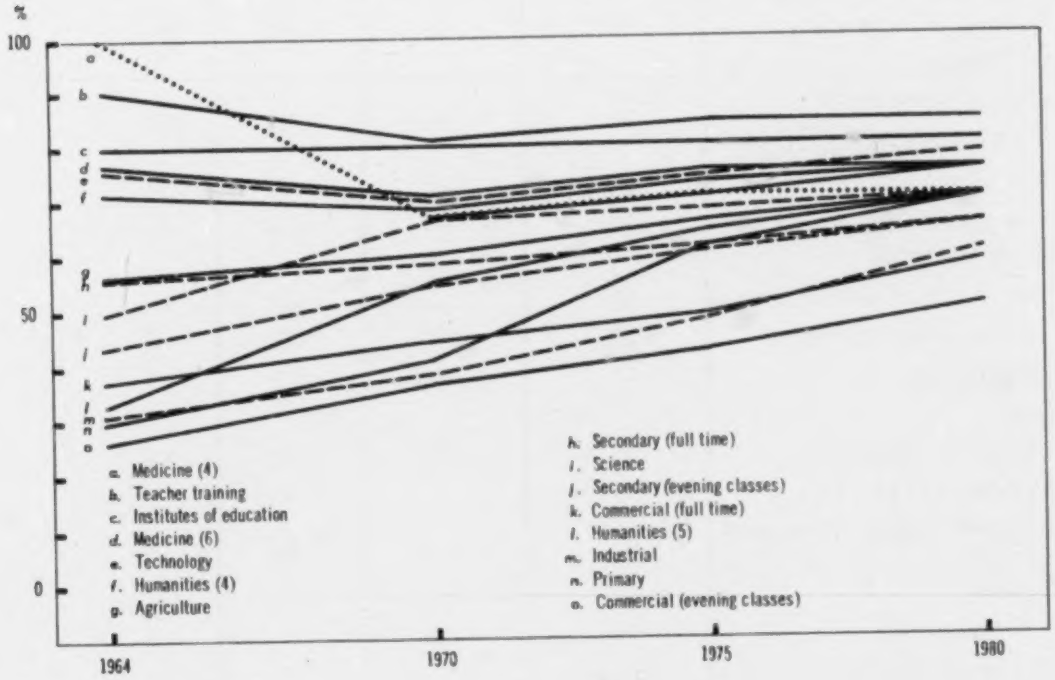
HYPOTHETICAL TOTAL PASS RATES FOR 1970, 1975 AND 1980 BY LEVEL AND BRANCH OF EDUCATION

Pass rates (%)

	1964	1970	1975	1980
PRIMARY	30.1	41	61	70
SECONDARY				
- GENERAL				
- full-time classes	56	58	61	65
- evening classes	43.4	54	60	65
- TECHNICAL				
- AGRICULTURAL	56	60	66	70
- INDUSTRIAL				
- boys	31	38	48	60
- girls	31	38	48	60
- COMMERCIAL				
- full-time classes	37	44	49	58
- evening classes	26	36	42	50
INTERMEDIATE	-	66	70	75
HIGHER				
- TEACHER TRAINING	90.1	81	84	85
- UNIVERSITIES				
- Institutes of education	80	80	80	80
- Arts				
- Arts (4)	71.2	68	73	75
- Arts (5)	33.2	55	64	70
- MEDICINE				
- medicine (4)	100	66	70	70
- medicine (6)	76.7	71	75	75
- SCIENCE	48.6	66	68	70
- TECHNOLOGY	76	70	74	78

Diagram 4-01

PASS RATE, BY LEVEL AND BRANCH OF EDUCATION, 1964, 1970, 1975 AND 1980



The differences in the pass rates between the various branches of secondary education would be considerably modified if there were a basic first cycle common to all branches and lasting at least three years. This seems to be best solution in view of the present structural shortcomings analysed in Chapter 2.

In higher education much better pass rates - or improved productivity - may logically be assumed, particularly as these are generally very specialised and applied subjects, where operating and investment costs are high - especially in the scientific and technological branches - and where growth should be relatively greater.

The fixing of target pass rates will naturally require a very precise policy to counteract the many causes of the low educational productivity observed up to now.

The qualitative aspect of educational planning has not yet been sufficiently examined but, in view of the importance of pass rates in the future development of education, should be given very special attention. This is not an easy task, for low productivity may be due both to the education system and to outside factors. To simplify, wastage may be due to three main causes: students who leave during term time; students who fail to pass their end-of-term examinations; students who pass their end-of-term examinations, but leave school.

Various measures are frequently proposed in educational journals to counteract these causes: social and financial aid to students; enrolment systems for pupils of compulsory school age; restructuring of the educational system to make it more flexible; the improvement of vocational guidance; measures to ensure regular attendance; a time limit for each cycle; accelerated promotion for pupils above the average class age; a reform of the system for marking apprentices; the establishment of a National Centre for Curriculum Development; constant control at national level of the improvements made to education; changes to the traditional system of requiring so many years of study, and to teaching on a subject basis; stricter requirements to stimulate learning, especially at the higher level; etc.

Such measures will be more or less possible - or desirable - according to the level, branch and discipline concerned. The means of carrying them out will also have to include the appropriate administrative machinery.

Lastly, their preparation should be the result of a joint technical effort at all levels, since all share the same problems, and the solutions will have to be consistent to ensure the basic unity of the education system.

For similar reasons a study should also be made of the subsequent careers of graduates from each level and branch. This should be one of the normal duties of the schools for, although almost completely overlooked in the past, it is vitally important if education is to play its part in the general development plans.

4.2.3. Projection of final-year enrolment up to 1980

As explained earlier, the 1961-80 period was split up into three shorter periods for the purpose of projecting final-year enrolments, to facilitate comparison with the 1967-1970 Economic and Social Development Plan. Table N° 4-06 shows estimates for the initial and final years of the plan, and also for 1975 and 1980.

Generally speaking, for basic education the increases will be very substantial as a result of higher enrolment and greater productivity. Thus, enrolment in the final primary year will go from 137,200 in 1964 to 250,900 in 1970, an increase of 82.9 per cent rising to 95.8 per cent in 1980. The corresponding increase for general secondary education will be 117.6 and 89.0 per cent; for the technical sections, where training is vocational, net requirements have been estimated by branch. The final-year enrolment projections reflect the country's economic and social development requirements so that relatively greater progress will be made in the (boys) industrial and educational branches than in the (girls) industrial branch, or in the commercial classes.

In higher education, net requirements for graduates from primary teacher-training schools can be met if the present growth rate is maintained. If suitable steps are taken to ensure that qualified teachers serve in the rural areas, and if the number of graduates being produced by 1967 remains constant, supply will be sufficient for the next ten years. The situation for graduates from the pedagogical institutes is still more delicate since, as from 1967, there will be more than double the 1980 requirements. The haphazard expansion at this level, the higher salaries provided for in the Act and Statutes concerning teachers' conditions of service, and the progressive appointment of teachers in secondary schools to permanent, full-time posts will soon lead to serious difficulties because of the surplus of certificated teachers, calling for urgent measures on the part of the Ministry of Education and the Inter-University Council.

Table 4-06

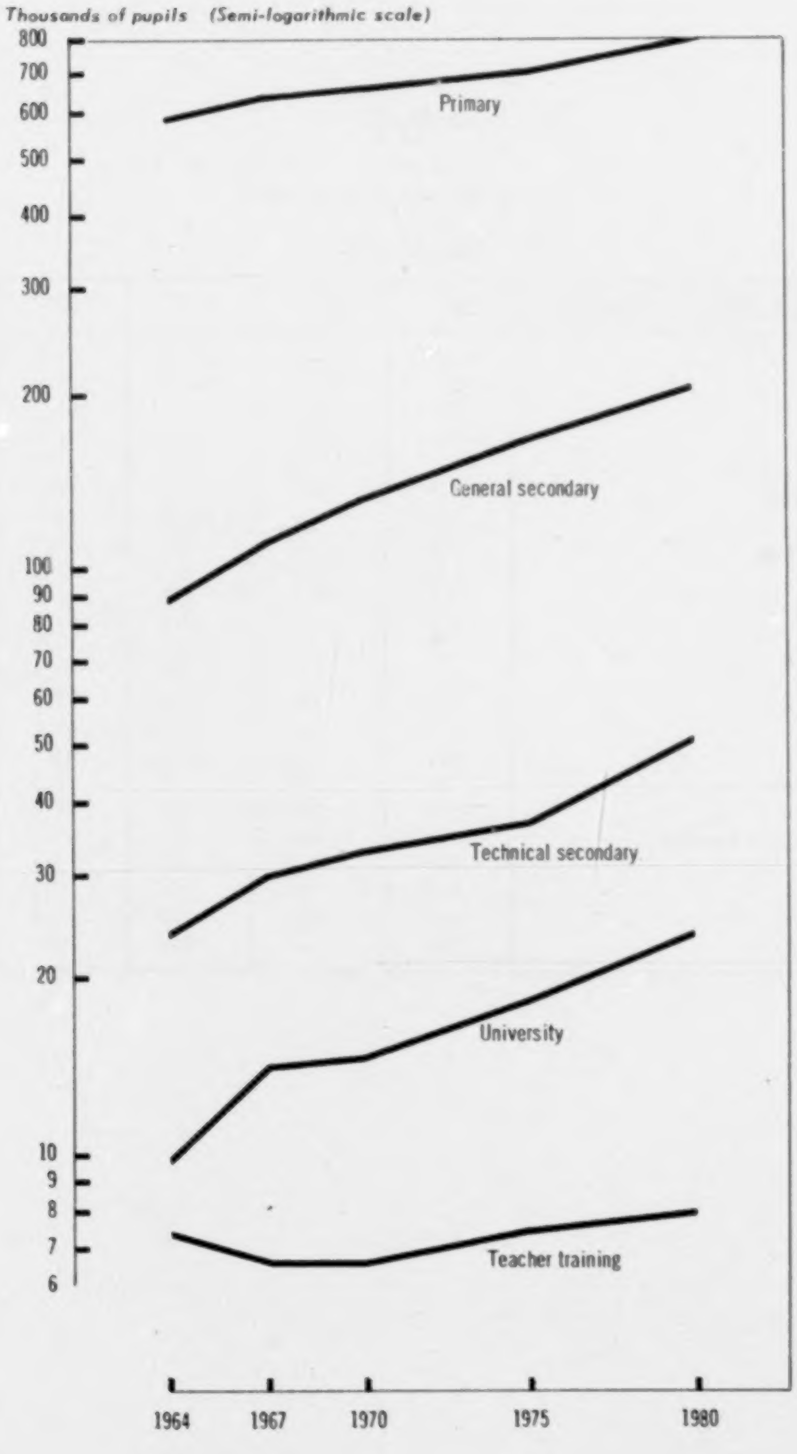
FORECASTS OF FINAL YEAR ENROLMENT FOR 1967, 1970, 1975 AND 1980 BY LEVEL AND BRANCH OF EDUCATION

(in thousands of pupils)

LEVEL AND BRANCH OF EDUCATION	1964	1967	1970	1975	1980
TOTAL	177.4	220.6	337.9	523.2	647.2
PRIMARY	137.2	163.4	250.9	403.6	491.3
SECONDARY	32.2	41.6	71.4	103.1	135.1
- GENERAL	27.2	35.0	59.2	86.3	111.9
- full-time classes	25.3	31.6	52.6	77.4	101.1
- evening classes	1.9	3.4	6.6	8.9	10.8
- TECHNICAL	5.0	6.6	12.2	16.8	23.2
- AGRICULTURAL	0.7	1.0	2.3	3.1	4.1
- INDUSTRIAL	1.9	2.7	4.9	7.4	11.5
- boys	1.1	1.3	2.7	4.5	7.6
- girls	0.8	1.4	2.2	2.9	3.9
- COMMERCIAL	2.4	2.9	5.0	6.3	7.6
- full-time classes	1.5	1.9	3.1	3.8	4.6
- evening classes	0.9	1.0	1.9	2.5	3.0
INTERMEDIATE	-	0.3	0.7	1.3	1.6
HIGHER	8.0	15.3	14.9	15.2	19.2
- TEACHER TRAINING	2.4	5.9	5.3	5.6	6.8
- UNIVERSITIES	5.6	9.4	9.6	9.6	12.4
- Institutes of education	1.8	3.4	2.6	1.4	1.4
- Humanities	1.9	3.2	3.7	3.3	3.4
- Medicine	0.4	0.5	0.6	0.8	1.3
- Science	0.5	0.7	0.9	1.8	3.4
- Technology	1.0	1.6	1.8	2.3	2.9

Diagram 4-02

TREND OF FIRST-YEAR ENROLMENT



In the humanities faculties the situation is much the same as in primary teacher training, although in the humanities a more specific study should be made of professions of strategic importance to national development. First science and then medicine, however, must be expanded considerably. Science has stood still, indicating a serious lack of interest on the part of the universities despite the considerable strategic value of science courses. In medicine a commendable zeal has kept the standard of graduates high, but their numbers are insufficient. Overall projects, which without sacrificing quality will ensure sufficient personnel to provide the whole of the country with medical services, must be set up immediately. The present rate of training for engineers seems fairly adequate, since the National University of Engineering and the Agrarian University already have overall development programmes.

Table Nº 4-06 also shows the changes in the proportions of graduates from the different levels. In secondary education, the proportion of technical graduates will tend to increase, rising to nearly 18 per cent of the total in 1980. In higher education, too, the proportion of graduates from the science and technological faculties will increase, rising from less than 24 per cent in 1964 to nearly 40 per cent in 1980.

4.2.4. Projection of first-year enrolment up to 1980.

Although forecasts for the expansion of education have been based on graduate forecasts, their attainment will depend on certain other targets concerning first-year enrolment and pass rates. Expansion which is not part of a general plan but is based exclusively on first-year enrolment, would mean that faculties depend on the demand for enrolment, on existing resources and the amount of expenditure required for new courses. The consequences of such a policy were fully discussed in Chapter 2, and were shown to be wasteful and disorderly. Chapter 3 showed that such a system is not an effective preparation for business life, is inadequate and constitutes a serious bottleneck in the country's development.

The bringing of educational, as well as other services into line with the requirements of the economy is necessary for both the individual and society. The individual may aspire to the full and free development of his ability without having to risk his future, and society may hope for the effective equilibrium of its human resources. This is particularly true if, at the same time, the objectives of the economy are included in the forecasts for an economic and social development plan.

Table N° 4-07 shows the results obtained by applying the pass rates quoted earlier to the number of graduates needed.

4.2.5. Projection of total enrolment up to 1980.

On the basis of the first and final year enrolments for each course, educational level or cycle, the school population in the intermediate grades can be calculated by interpolation, the assumption being made that the number of those repeating a class will increase as the course advances. Hypothetical repeat rates were worked out on the basis of first-year enrolment in 1967. This method gave the total enrolment figures shown in Table N° 4-08, that is, the required future structure for total school population in order to meet the needs of the economy, and assuming greater productivity in educational services. The basic change in structure takes the form of a relative reduction in nursery and primary education and a relative increase in secondary education.

In absolute terms, expansion will be considerable in nursery and primary education, as will be explained later, for the number of pupils at these levels will double between 1964 and 1980, even though the proportion they represent in total school population will fall from 82.7 to 78.1 per cent over the same period.

Total enrolment for secondary education will be three times greater in 1980 than in 1964, increasing from 14.4 to 19.3 per cent of total enrolment. While the relative strength of general and technical secondary education will probably remain the same as in 1964, the considerable increase necessary in the output of technical graduates, especially in the (boys) industrial and the agricultural branches, can be achieved by an improvement in the productivity of technical education.

In higher education also total enrolment will practically double between 1964 and 1980. Teacher training and education will fall from 37.7 per cent of total enrolment to only 30.6 per cent; the humanities will fall from 35.7 to 19.5 per cent, medicine will go up from 6.0 to 12.7 per cent, and science from 6.7 to 22.8 per cent; engineering will rise, though very slightly, to 14.4 per cent. A comparison between the structure of total enrolment projected for 1980 as compared with that for 1955, shows that in both cases teacher training, education and the humanities together account for approxi-

Table 4-07

FORECAST OF FIRST YEAR ENROLMENT FOR 1967, 1970, 1975 AND 1980, BY LEVEL AND BRANCH OF EDUCATION

(in thousands of pupils)

LEVEL AND BRANCH OF EDUCATION	1964	1967	1970	1975	1980
TOTAL	725.0	801.4	848.9	933.0	1083.2
PRIMARY	595.7	639.8	661.2	701.8	795.8
SECONDARY	112.0	140.4	164.9	203.6	252.8
- GENERAL	88.2	110.5	132.2	166.4	201.8
- full-time classes	77.7	96.4	117.4	149.7	181.5
- evening classes	10.5	14.1	14.8	16.7	20.3
- TECHNICAL	23.8	29.9	32.7	37.2	51.0
- AGRICULTURAL	2.8	4.0	4.5	5.5	7.4
- INDUSTRIAL	10.2	13.1	14.7	17.8	27.3
- boys	5.6	7.4	8.8	11.5	19.1
- girls	4.6	5.7	5.9	6.3	8.2
- COMMERCIAL	0.8	12.8	10.5	13.9	16.3
- full-time classes	5.9	7.2	7.6	7.9	9.0
- evening classes	4.9	5.6	5.9	6.0	7.3
INTERMEDIATE	0.4	0.8	1.7	1.9	2.3
HIGHER	16.9	20.4	21.1	25.7	32.3
- TEACHER TRAINING	7.3	6.5	6.5	7.4	8.0
- UNIVERSITIES	9.6	13.9	14.6	18.3	24.3
- Institutes of education	2.4	3.2	2.3	2.1	2.1
- Humanities	3.6	5.2	5.3	5.4	5.4
- Medicine	0.7	1.1	1.5	2.4	3.6
- Science	0.5	1.7	2.5	4.9	8.7
- Technology	2.4	2.7	3.0	3.5	4.5

Table 4-08

FORECAST OF TOTAL SCHOOL POPULATION FOR 1967, 1970, 1975 AND 1980, BY LEVEL AND BRANCH OF EDUCATION

(in thousands of pupils)

LEVEL AND BRANCH OF EDUCATION	1964	1967	1970	1975	1980
TOTAL	2,220.1	2,814.1	3,312.8	4,133.3	4,918.1
NURSERY AND PRIMARY	1,836.3	2,279.2	2,651.6	3,278.8	3,839.5
SECONDARY	319.9	451.0	571.2	751.2	949.1
- GENERAL	260.3	362.8	462.8	618.3	770.8
- full-time classes	229.7	313.6	399.8	544.7	681.9
- evening classes	30.6	49.2	63.0	73.6	88.9
- TECHNICAL	59.6	88.2	108.4	132.9	178.3
- AGRICULTURAL	7.0	12.4	16.2	20.7	27.5
- INDUSTRIAL	24.8	36.6	45.4	60.3	90.2
- boys	13.7	20.2	26.3	38.1	61.8
- girls	11.1	16.4	19.1	22.2	28.4
- COMMERCIAL	27.8	39.2	46.8	51.9	60.6
- full-time classes	15.1	21.3	25.0	28.1	32.1
- evening classes	12.7	17.9	21.8	23.8	28.5
INTERMEDIATE	0.4	1.6	3.5	4.7	5.6
HIGHER	63.5	82.3	86.5	98.4	123.9
- TEACHER TRAINING	12.1 a/	18.6	23.3	25.7	29.2
- UNIVERSITIES	51.4	63.7	63.2	72.7	94.7
- Institutes of education	11.8 a/	14.6	12.1	8.7	8.7
- Humanities	22.7	28.0	24.8	24.2	24.2
- Medicine	3.8	5.2	6.6	10.2	15.7
- Science	4.3	5.7	8.0	15.4	28.2
- Technology	8.8	10.2	11.7	14.1	17.9

a/ Primary-teacher training only. Training Colleges for general secondary and physical training schools are shown under the heading "Institutes of Education".

Diagram 4-03

FINAL-YEAR ENROLMENT TREND

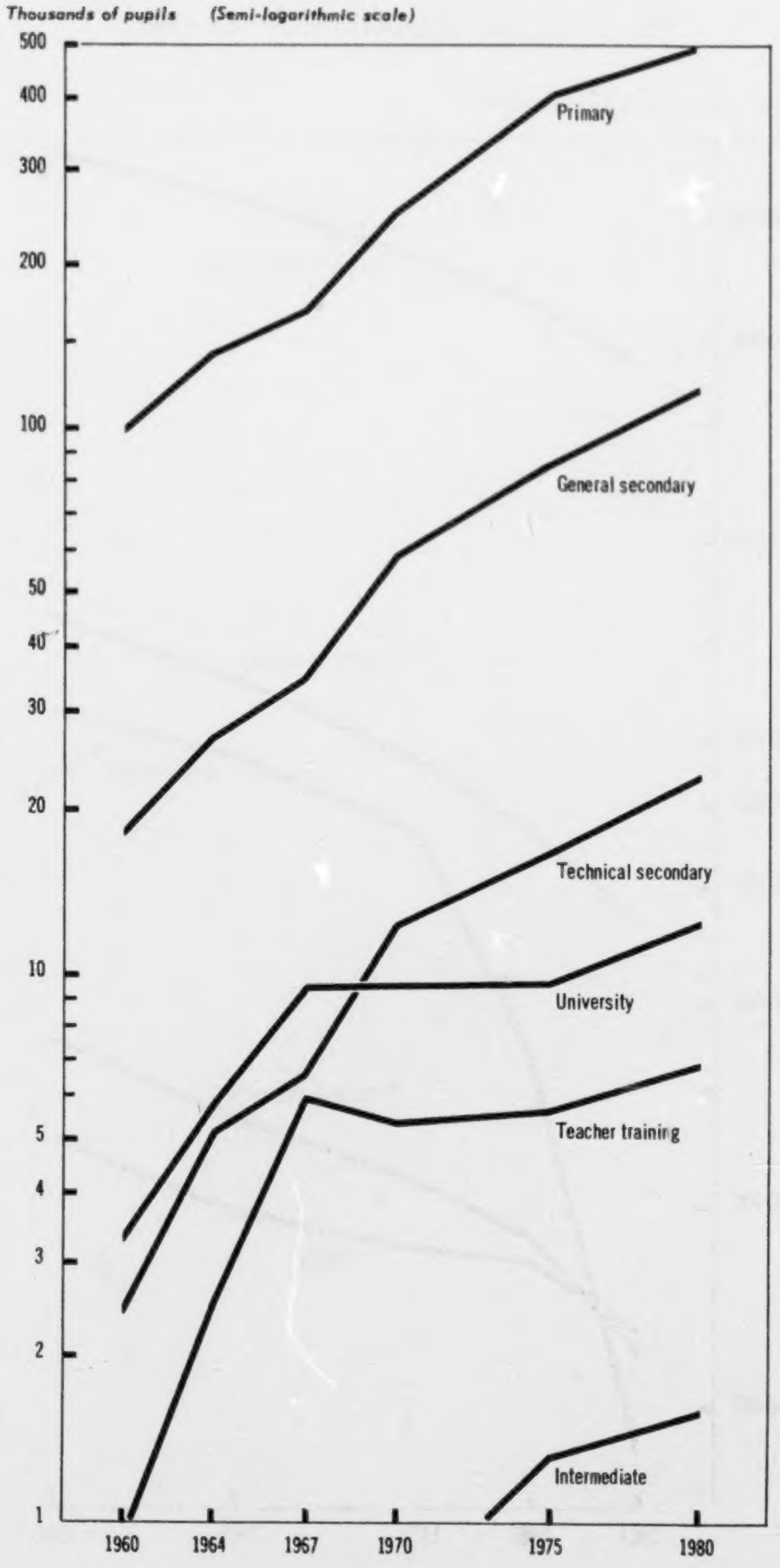
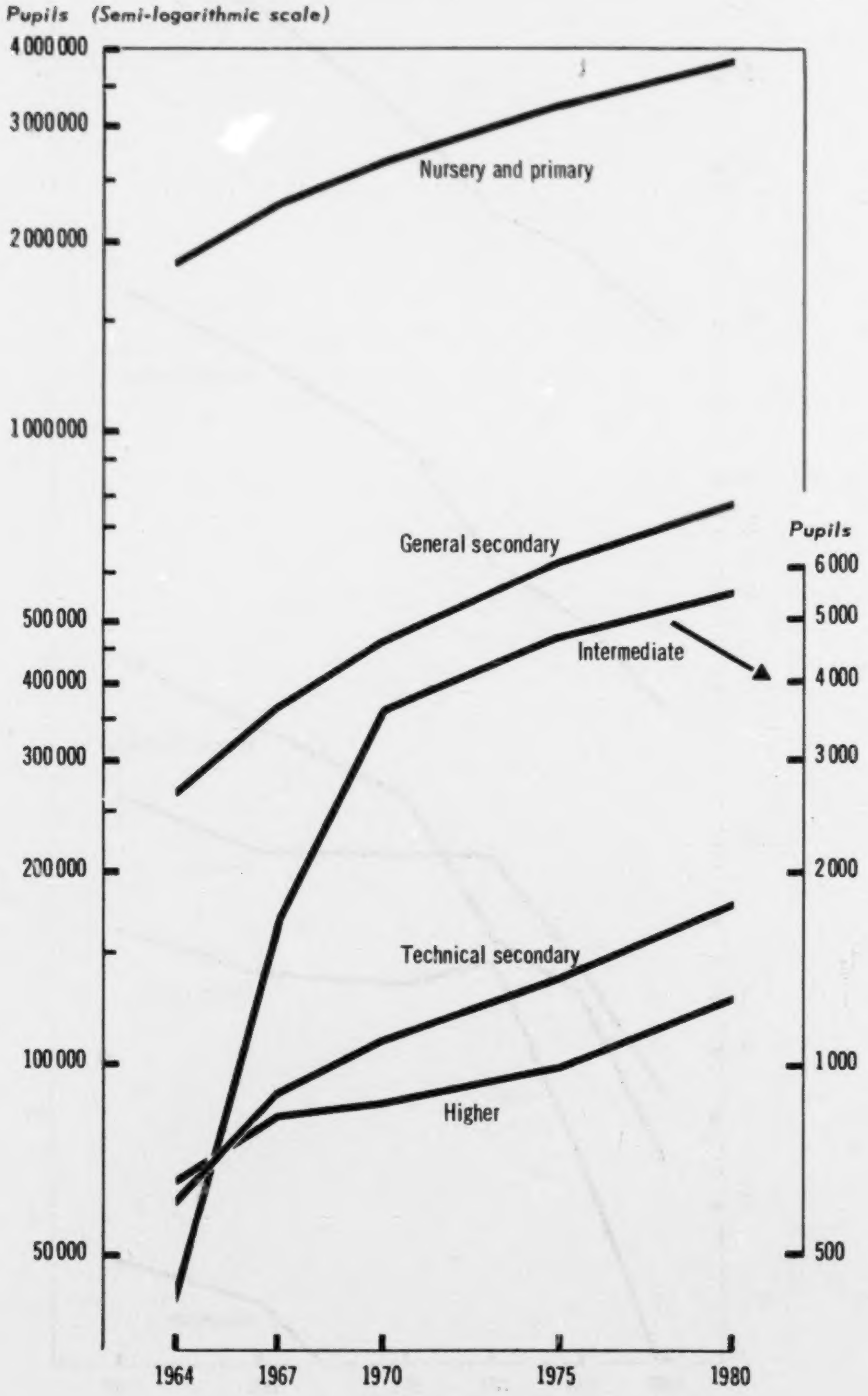


Diagram 4-04

FORECAST OF TOTAL SCHOOL POPULATION BY LEVEL OF EDUCATION UP TO 1980



mately 50 per cent of total enrolment, and that the percentages for medicine, science and engineering are much the same, whereas in 1964, teacher training, education and the humanities accounted for 73.4 per cent of total enrolment. The proposed changes for higher education should therefore correct the haphazard growth of the past ten years by imposing a more disciplined expansion in line with the country's needs and the targets of the economic and social development plan.

4.2.6. Projection of primary and nursery-school education

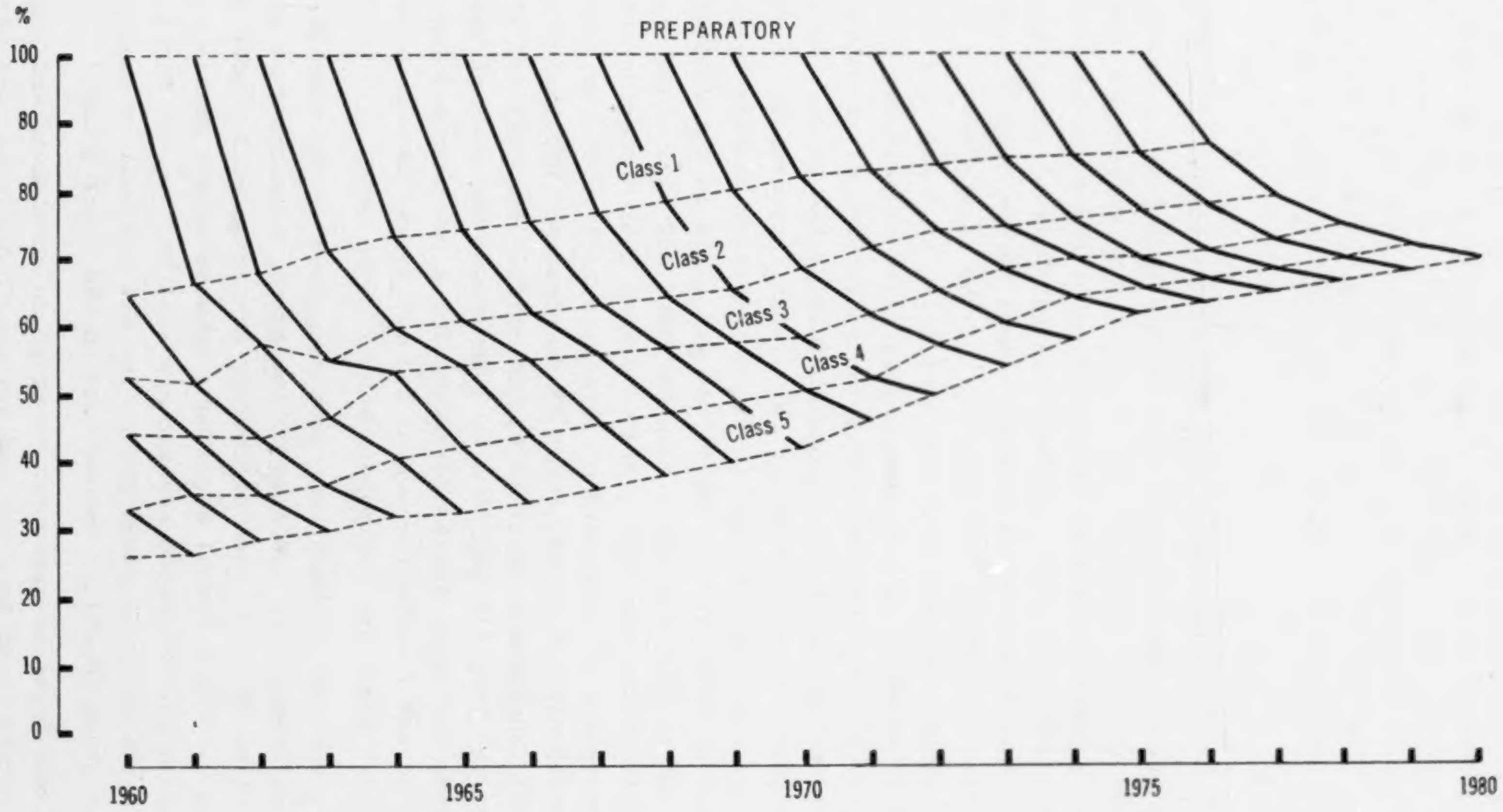
In primary education, an attempt has been made to bring the age of the students more into line with the corresponding class. First, the relation between the evolution of the seven-year-old population and first-year enrolment was established (preparatory classes - i.e. last year of nursery school before starting primary school - are included). 72.2 per cent of the seven-year-old boys attended school, of whom 64.4 per cent (i.e. 46.5 per cent of the total) were enrolled in the preparatory classes; 24.9 per cent of the pupils in these classes were seven years old. If we multiply the first percentage by the second and divide the product by the third we obtain a coefficient of 18.7 which indicates the ratio for boys of the children enrolled in the preparatory classes to the total population of seven years. The values for girls in the same year were 61.8 per cent, 65.9 per cent, 24.0 per cent and 1.7, respectively. These coefficients are fairly high and mean that a considerable age-disparity exists at the start of primary school, with the serious consequences already noted. For this reason, when hypotheses are established separately until 1974, and jointly for boys and girls from 1975 to 1980, for the 1964 to 1980 trends for each of the three percentages indicated above, forecasts for first year enrolment should be adjusted until a coefficient of 1.5 is reached between enrolment in the first grade and the population of seven years.

Hypothetical calculations were then made of the average ages and the differences in the ages of the school population in each primary class in 1975, when compulsory education will become general and there will be a normal adjustment between school grades and pupils'ages. The estimated average age will be 7 in the first grade and 13 in the sixth or final grade. The age gap will be smallest in the first grade (0.75) to become 1.25 in the final grade.

On the basis of estimated first grade enrolments and pass rate trends, school flows by grade and sex were calculated, and adjusted

Diagram 4-05

TREND FOR SURVIVAL RATE IN (BOYS) FILL-TIME PRIMARY SCHOOL, 1960-1980



on the assumptions made concerning average ages and their deviation from normal. Estimated enrolment in the final grade (Table N° 4-06) in the first grade (Table N° 4-07) and total enrolment (Table N° 4-08) were thus obtained. By applying the hypothetical age-composition to the primary school population we obtained the enrolment rates given in Table N° 4-09, for each year for 5 to 19 years-olds, by sex in 1970, and for all pupils in 1975 and 1980.

In 1980, 100 per cent of the 7-10 year-old population will attend primary school, 95 per cent of the 11 year-olds, 85 per cent of the 12 year-olds and 50 per cent of the 13 year-olds. For the 5 to 12 age group the hypotheses used give a rising enrolment rate, while for the 13 and over group the adjusting of the ages gives a fall in the enrolment rate. For 1970-1975, the highest targets are for the 8 and 9 year-olds for whom enrolment is expected to exceed 90 per cent.

The Commissions for the 1967-1970 Plan will have to make a special study of the manner in which this social policy for primary education can be carried out. Insufficient attention has been given to the age factor, an essential element when deciding curricula. Only general figures have been given for a system which is developing very slowly and which, without rational planning, cannot cope with universal compulsory education, or more than the minimum required by an expanding society. This is another outside factor affecting the productivity of the education system.

In 1964, the enrolment rate for five-year olds in nursery schools was 8.9 per cent. It is proposed to raise this to 12, 16 and 20 per cent in 1970, 1975 and 1980 respectively, thanks to the greater possibilities offered to six year-olds and over in primary schools. For the five year-olds, three out of every four pupils will be in nursery schools. These five year-olds will represent approximately 40 per cent of all children in nursery schools.

The hypotheses used are very general and further studies are required on a number of important social questions such as the extension of nursery school level (creation of day nurseries to help working mothers etc.). These studies are particularly necessary as our hypotheses are based on the assumption that more women will become part of the labour force.

4.2.7. Growth of the school population in the periods 1964-1970 and 1970 - 1980.

Table 4-09

ENROLMENT RATE IN PRIMARY SCHOOL FOR THE 5-19 YEAR POPULATION
BY AGE AND SEX FOR 1964, 1970, 1975 AND 1980

Age	1964			1970			1975	1980
	Total	Boys	Girls	Total	Boys	Girls		
5	2.8	2.6	3.0	3	3.5	3.5	4	5
6	47.6	49.0	46.1	55	55	55	60	65
7	66.9	72.0	61.7	87.5	90	85	95	100
8	71.4	72.7	70.0	92.5	95	90	100	100
9	74.2	77.4	70.9	92.5	95	90	100	100
10	72.0	77.0	66.8	87.5	90	85	95	100
11	65.8	70.9	60.6	77.5	80	75	90	95
12	61.0	67.5	54.2	70	75	65	80	85
13	52.9	61.0	44.5	55	60	50	55	50
14	37.6	45.5	29.6	35	40	30	33	30
15	24.1	31.0	17.1	22	23	21	15	5
16	15.4	21.3	9.4	8	11	5	5	-
17	7.9	11.4	4.3	4	6	2	-	-
18	4.1	6.2	1.8	2	3	1	-	-
19	2.0	3.2	0.7	0.5	1	-	-	-

The average annual increases shown in absolute figures in Table N° 4-10 are intended simply to illustrate the relative magnitude of the quantitative expansion of the education system from the base year to the last year of the 1967-1970 Plan, and from 1970 until 1980, the final period for which projections have been made. Generally speaking, as we shall show later, the overall effort will be more intensive between 1964 and 1970, because of the financial implications of educational expansion. For university education we have already stated that the numbers of students in the different faculties must first be corrected to bring them into line with the economy's graduate requirements. For these reasons the figures in Table N° 4-10 should be regarded as a comparative basis for assessing the relative expansion of the various disciplines.

The methodology followed means that the quantitative forecasts imply a qualitative judgment on the number of graduates in relation to the needs of the economy, a factor which, in turn, may contribute to the restructuring of the education system and to changes in the curriculum. Consequently we do not advocate a merely quantitative extension of education, neither are the solutions to the qualitative and quantitative problems interchangeable. Measures to improve quality cannot be omitted from the techniques for planning for educational development. On the contrary, this is a vast area being opened up to the planning of education in Peru and the authorities in charge of the technical management of education can make a valuable contribution if, taking advantage of existing basic studies, they start the large-scale research into the question of quality. The absence of such research is at present seriously hampering the work of planning.

4.2.8. Structure of the school population and school enrolment rates by five-year age groups.

If, as mentioned for primary education, the age of the pupils corresponded better to their school grades, this would have repercussions at the other levels of the education system, where a higher pass rate would also help to bring age and grade into line. Table N° 4-11 shows the probable structure of the total school population by five-year age-groups in 1970, 1975 and 1980, calculated on the basis of the enrolment rate obtained by comparing school enrolment with the total future population for each five-year age-group (see Table N° 4-12).

Table 4-10

AVERAGE ANNUAL INCREASE IN SCHOOL POPULATION FOR THE PERIODS
1964-1970 AND 1970-1980
(in hundreds of pupils)

	AVERAGE ANNUAL INCREASE					
	Total enrolment		First-year enrolment		Final-year enrolment	
	1964-1970	1970-1980	1964-1980	1970-1980	1964-1970	1970-1980
TOTAL	1,821.3	1,605.3	206.5	234.3	267.4	309.3
NURSERY AND PRIMARY	1,358.9	1,187.9	109.2	134.6	189.5	240.4
SECONDARY	418.8	377.9	88.2	87.9	65.3	63.7
- GENERAL	337.5	308.0	73.4	69.6	53.3	52.7
- Full-time	283.5	282.1	66.2	64.1	45.5	48.5
- Evening classes	54.0	25.9	7.2	5.5	7.8	4.2
- TECHNICAL	81.3	69.9	14.8	18.3	12.0	11.0
- AGRICULTURAL	15.3	11.3	2.8	2.9	2.7	1.8
- INDUSTRIAL	34.3	44.8	7.5	12.6	5.0	6.6
- boys	21.0	35.5	5.3	10.3	2.7	4.9
- girls	13.3	9.3	2.2	2.3	2.3	1.7
- COMMERCIAL	31.7	13.8	4.5	2.8	4.4	2.6
- full-time	16.5	7.1	2.8	1.4	2.7	1.5
- evening classes	15.2	6.7	1.7	1.4	1.7	1.1
INTERMEDIATE	5.2	2.1	2.2	0.6	1.2	0.9
HIGHER	38.4	37.4	6.9	11.2	11.4	4.3
- TEACHER TRAINING	18.7	5.9	- 1.3	1.5	4.8	1.5
- UNIVERSITIES	19.7	31.5	8.2	9.7	6.6	2.8
- Institutes of education	0.5	- 3.4	- 0.2	- 0.2	1.3	- 1.2
- Humanities	3.5	- 0.6	2.8	0.1	3.0	- 0.3
- Medicine	4.7	9.1	1.3	2.1	0.3	0.7
- Science	6.2	20.2	3.3	6.2	0.7	2.5
- Technology	4.8	6.2	1.0	1.5	1.3	1.1

Table 4-11

FORECAST OF THE SCHOOL POPULATION STRUCTURE FOR FIVE-YEAR AGE GROUPS, FOR 1970, 1975 AND 1980, BY LEVEL AND BRANCH OF EDUCATION

Age Group	All levels			Nursery and primary			SECONDARY								
							Sub-total			General			Technical		
	1970	1975	1980	1970	1975	1980	1970	1975	1980	1970	1975	1980	1970	1975	1980
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
0-4	1.5	1.8	2.1	1.8	2.2	2.8	-	-	-	-	-	-	-	-	-
5-9	40.9	41.2	41.4	51.1	51.9	53.0	-	-	-	-	-	-	-	-	-
10-14	40.1	40.8	40.7	43.0	43.7	43.7	33.2	34.1	34.4	36.9	38.5	40	17.5	13.7	10
15-19	14.2	13.3	13.0	4.1	2.2	0.5	58.3	59.3	60.6	55.4	55.2	55	70.8	78.2	85
20-24	2.6	2.6	2.5	-	-	-	7.4	6.6	5.0	6.6	6.3	5	10.8	8.1	5
25-29	0.5	0.2	0.2	-	-	-	1.1	-		1.1	-	-	0.9	-	-
30 and over	0.2	0.1	0.1	-	-	-	-	-		-	-	-	-	-	-

Age Group	INTERMEDIATE			HIGHER								
				Sub-total			Teacher training			Universities		
	1970	1975	1980	1970	1975	1980	1970	1975	1980	1970	1975	1980
Total	100	100	100	100	100	100	100	100	100	100	100	100
0-4	-	-	-	-	-	-	-	-	-	-	-	-
5-9	-	-	-	-	-	-	-	-	-	-	-	-
10-14	-	-	-	-	-	-	-	-	-	-	-	-
15-19	50	50	50	30.4	31.0	30.9	52.2	51.7	50	22.3	23.7	25
20-24	50	50	50	50.6	54.0	57.6	46.8	48.3	50	52.0	56.0	60
25-29	-	-	-	12.5	10.0	7.7	1.0	-	-	16.8	13.4	10
30 and over	-	-	-	6.5	5.0	3.8	-	-	-	8.9	6.9	5

Table 4-12

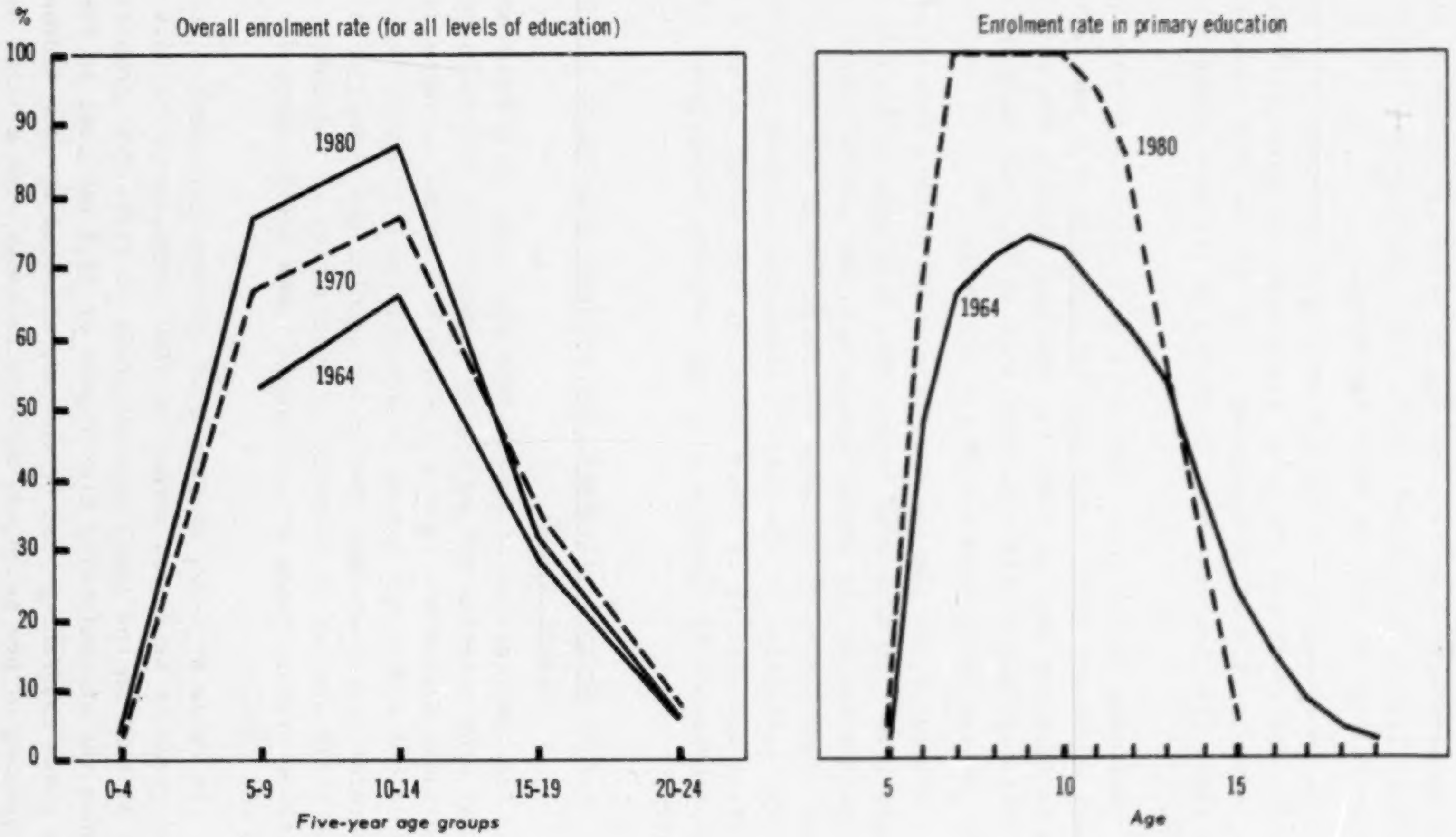
FORECAST OF ENROLMENT RATES FOR FIVE-YEAR AGE GROUPS, FOR 1970,1975 AND 1980,
BY LEVEL AND BRANCH OF EDUCATION

Age group	All levels			Nursery and primary			Secondary								
							Sub total			General			Technical		
	1970	1975	1980	1970	1975	1980	1970	1975	1980	1970	1975	1980	1970	1975	1980
0-4	2.0	2.7	3.4	2.0	2.7	3.4	-	-	-	-	-	-	-	-	-
5-9	67.2	73.6	76.6	67.2	73.6	76.6	-	-	-	-	-	-	-	-	-
10-14	77.0	84.3	87.2	66.0	71.5	73.1	11.0	12.8	14.2	9.9	11.9	13.4	1.1	0.9	0.8
15-19	33.7	32.2	32.1	7.7	4.2	1.1	23.9	26.0	29.0	18.4	19.9	21.3	5.5	6.1	7.6
20-24	7.4	7.7	7.2	-	-	-	3.6	3.6	2.8	2.6	2.8	2.3	1.0	0.8	0.5
25-29	1.8	0.8	0.7	-	-	-	0.6	-	-	0.5	-	-	0.1	-	-

Age group	Intermediate			HIGHER								
				Sub total			Teacher training			Universities		
	1970	1975	1980	1970	1975	1980	1970	1975	1980	1970	1975	1980
0-4	-	-	-	-	-	-	-	-	-	-	-	-
5-9	-	-	-	-	-	-	-	-	-	-	-	-
10-14	-	-	-	-	-	-	-	-	-	-	-	-
15-19	0.1	0.1	0.1	1.9	1.8	1.9	0.9	0.8	0.7	1.0	1.0	1.2
20-24	0.1	0.2	0.2	3.7	3.9	4.2	0.9	0.9	0.9	2.8	3.0	3.4
25-29	-	-	-	1.1	0.8	0.7	0.0	-	-	1.1	0.8	0.7

Diagram 4-06

RATIO OF SCHOOL TO TOTAL POPULATION FOR VARIOUS AGE GROUPS



In secondary education the age of entry is higher on the technical than on the general side, the proportion and enrolment rate being highest for the 15-19 age-group.

In intermediate and College education, enrolment is about the same for the 15-19 and the 20-24 age-groups. In university education, however, the 20-24 age-group is by far the most important with about 85%, the remainder belonging to the next highest age-group.

Children in the 10-14 age-group will continue to have the highest enrolment rate, since this will go from 66.1 per cent in 1964 to 87.2 per cent in 1980. For the same period, the rate for the 15-19 age-group will rise from 28.4 to 32.1 per cent and for the 20-24 age-group from 6.1 to 7.2 per cent.

Obviously, if the age and grade after primary school are brought into line with each other, this will mean relatively lower enrolment rates in the higher age-groups. Any action taken here should therefore be to increase participation in the country's economic activities of the over-15 population without sacrificing the level and quality of their training. This would inject a considerable amount of dynamism into the economic development of the country.

4.2.9. Gross coefficients for students passing to the next higher level.

The coefficients of passes from one level to another are important when checking and adjusting quantitative forecasts of educational expansion. They also allow a relative estimate to be made of the subsequent career of the persons graduating from a particular level, whether they enter gainful employment or continue their studies in branches or specialties at the level immediately higher. Table N° 4-13 shows these coefficients for 1970, 1975 and 1980.

In Table N° 2-32, Chapter 2 we saw that enrolment in the first grade of secondary school in 1960 corresponded to 70.4 per cent of that in the final primary grade in 1959. This proportion reached the exceptionally high figure of 91.9 per cent in 1964. This gross coefficient is, of course, affected by such factors as the opening of new secondary schools in areas with a large number of pupils completing primary school, and by the large percentage

Table 4-13

GROSS COEFFICIENTS OF CONTINUATION FROM ONE EDUCATIONAL LEVEL TO THE NEXT. FORECAST FOR 1970,1975 AND 1980, BY LEVEL AND BRANCH OF EDUCATION

Percentages of first year enrolment in relation to final years enrolment of the level immediately belon

	Primary - Secondary			Secondary - Higher		
	1970	1975	1980	1970	1975	1980
SECONDARY	71.8	54.8	53.3			
- SECONDARY GENERAL	57.5	44.8	42.6			
- Full-time	51.1	40.3	38.3			
- Evening classes	6.4	4.5	4.3			
- TECHNICAL SECONDARY	14.3	10.0	10.7			
- AGRICULTURAL	2.0	1.5	1.6			
- INDUSTRIAL	6.4	4.8	5.7			
- boys	3.8	3.1	4.0			
- girls	2.6	1.7	1.7			
- COMMERCIAL	5.9	3.7	3.4			
- Full-time	3.3	2.1	1.9			
- Evening classes	2.6	1.6	1.5			
INTERMEDIATE				2.7	2.0	1.8
HIGHER				33.0	26.8	25.3
- TEACHER TRAINING				10.2	7.7	6.3
- UNIVERSITIES				22.8	19.1	19.0
- Institutes of education				3.6	2.2	1.7
- Humanities				8.3	5.6	4.2
- Medicine				2.3	2.5	2.8
- Science				3.9	5.1	6.8
- Technology				4.7	3.7	3.5

of pupils repeating the first secondary grade. But it also reflects a high degree of selectivity in primary education where only a small proportion have passed the final examination in recent years. Since all these factors are influenced by the forecasts in the present survey, it may be assumed that in net terms the coefficients for those who go from primary to secondary education will fall to 53.3 per cent in 1980. The coefficients for the various branches of education can serve as a basis for vocational guidance programmes if, for example, it can be estimated that, in future, out of every 25 students enrolled in the final primary grade, one will enter the industrial (boys) branch, etc., in the following year.

The situation is more or less the same concerning passes from secondary to higher education. The coefficient, which rose from 44.3 per cent in 1960 to 62.5 per cent in 1964, will probably fall to only half this in 1980 if secondary education ceases to be regarded solely as a preparation for higher studies. In the future, out of every 100 persons enrolled in the final secondary grade, only 25.3 will go on to higher studies, 8 to the pedagogical specialities, 6.8 to scientific studies, 4.2 to the humanities, 3.5 to engineering and 2.8 to medicine.

4.3. Needs in terms of teaching, administrative and service personnel

4.3.1. Pupil/teacher ratio and forecast of teachers

Forecasts of teacher requirements for the expansion of education have been based on the pupil/teacher ratio. The 1964 average pupil/teacher ratio for each level and branch has been adjusted and expressed in terms of net numbers, since the statistics show the number of teaching posts, and consequently duplicate part-time teachers and teachers holding two posts. The first two columns of Table Nº 4-14 show this adjustment, calculated on the basis of the ratio between the number of teachers shown in the statistics and the number who gave teaching as their main occupation in the Census.

The hypotheses for 1980 assume an increase in the workload of teachers in primary and general secondary schools; these schools provide general education and are greatly affected at present by the great dispersion in the size of the different streams. Slightly higher standards might be adopted than the present averages, particularly as these two types of education will account for almost

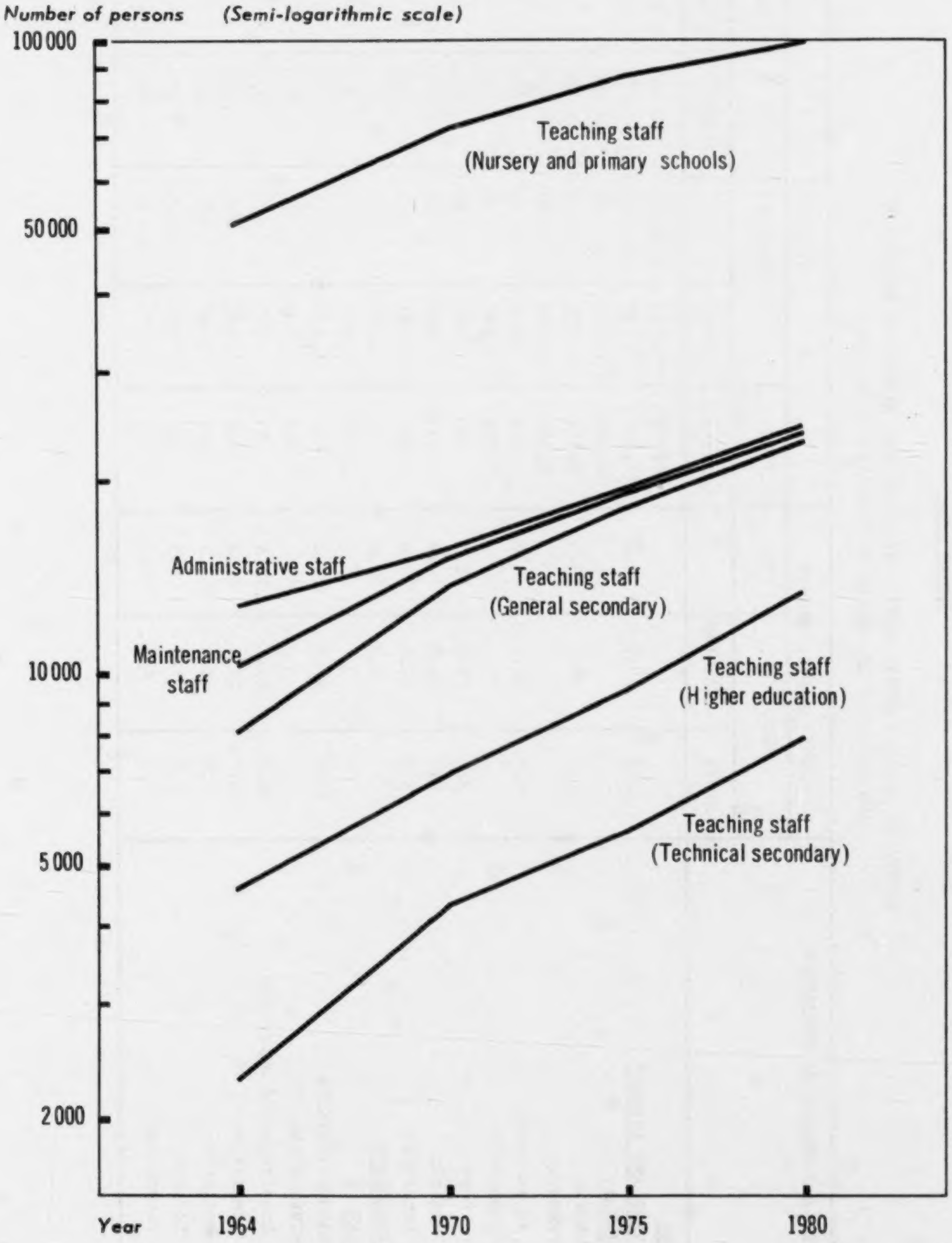
Table 4-14

ESTIMATED PUPIL/TEACHER RATIO, BY LEVEL AND BRANCH OF EDUCATION AND FORECAST OF NUMBER OF TEACHERS UP TO 1980

LEVEL AND BRANCH OF EDUCATION	Ratio pupil/teacher			Teachers					
	1964		1980	1964	Forecast			Annual average increase	
	Gross	Adjusted		Adjusted	1970	1975	1980	1964-70	1970-80
TOTAL				66,308	96,820	119,840	142,460		
NURSERY AND PRIMARY	35.7	35.7	39.3	51,437	71,470	85,830	97,700	3,339	2,623
SECONDARY				10,266	18,110	24,240	31,000		
- GENERAL	16.2	28.7	29.5	8,002	13,790	18,650	23,100	965	931
- TECHNICAL				2,264	4,320	5,590	7,900		
- Agricultural	8.6	20.1	18.0	350	840	1,110	1,530	82	69
- Industrial				1,285	2,380	3,190	4,830		
- boys	8.8	18.3	18.2	750	1,440	2,090	3,400	115	196
- girls	9.2	20.7	19.9	535	940	1,100	1,430	68	49
- Commercial	11.0	24.0	20.8	629	1,100	1,290	1,540	78	44
INTERMEDIATE		9.9	10.0	38	350	470	560	52	21
HIGHER				4,567	6,890	9,300	13,200		
- TEACHER TRAINING	10.4	20.7	15.0	650	1,250	1,530	1,950	100	70
- UNIVERSITIES				3,917	5,640	7,770	11,250		
- Institutes of education	22.8	25.4	11.6	464	600	680	750	23	15
- Humanities	15.2	21.7	20.2	1,045	1,180	1,190	1,200	22	2
- Medicine	2.6	5.8	5.2	665	1,180	1,910	3,000	86	182
- Science	5.0	9.1	8.3	469	910	1,790	3,400	74	249
- Technology	5.2	6.9	6.2	1,274	1,770	2,200	2,900	83	113

Diagram 4-07

FORECASTS OF STAFF IN SERVICE IN EDUCATION



two-thirds of the total expenditure on education.

A smaller pupil/teacher ratio has been assumed for the other levels and branches, however, because of the fact that they will be much more varied in future, and because of the vocational and specialised nature of the work.

On the basis of the estimated workloads for 1980, an interpolation was made for the intermediate years 1970 and 1975; Table N° 4-14 shows the number of full-time teachers corresponding to total enrolment for each level and branch (Table N° 4-08).

The average annual increase in the number of teachers bears out the considerable quantitative effort to be accomplished between 1964 and 1970. The most serious difficulty will be in meeting the growing demand for teachers in the scientific and technological faculties, for this demand will be felt sharply in the very near future and ought to receive priority in development plans.

The number of teachers in service in 1961 who will still be teaching in 1980 was calculated by using the general methodology described in Chapter 3. Account was taken, for each level and branch, of the special retirement and superannuation schemes for teachers, of the teaching experience required of candidates for posts in higher education, and of the sex and age composition of the teaching staff. The difference between total requirements for 1980 and the number who were in service in 1961 showed the number of new teachers required during the period 1961-1980. It was assumed that the vigorous growth expected in education, the improvement in quality and productivity, and the better working conditions assured by the Act on teachers' conditions and salaries would result in better career possibilities for teachers and the generalisation of full-time service.

Table N° 4-15 gives a percentage breakdown of the educational qualifications of teachers in 1980 for each level and branch, taking into account the survivors from 1961 and new entrants during the period 1961-1980. For purposes of comparison this table also shows the qualifications given in the National Census of 1961. Table N° 4-16 gives a breakdown of teacher requirements in absolute figures for all levels and branches, by educational qualifications.

We saw in Chapter 3 how the manpower needs of education should be met from the country's total manpower resources so as to enable the human resources needed by the other economic and social sectors

Table 4-15

EDUCATIONAL QUALIFICATIONS OF TEACHING STAFF IN 1980

EDUCATIONAL LEVEL OF TEACHING STAFF	TEACHING STAFF													
	NURSERY AND PRIMARY		SECONDARY					HIGHER						
			General		Technical		Inter-mediate	Sub total	Teacher training	Insti-tutes of educa-tion	Human-ities	Medi-cine	Science	Techno-logy
	1961	1980	1961	1980	1961	1980	1980	1961	1980	1980	1980	1980	1980	1980
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Primary	15.1	3.7 a/	1.0	-	12.9	-	-	-	-	-	-	-	-	-
Secondary	46.5	16.6	8.1	-	50.8	10	-	-	-	-	-	-	-	-
- General	43.3	15.4	7.0	-	27.8	-	-	-	-	-	-	-	-	-
- Technical	3.2	1.2	1.1	-	23,0	10	-	-	-	-	-	-	-	-
Higher	36.1	78.9	85.7	100	27.4	90	100	97.9	100	100	100	100	100	100
- Teacher training	31.4	76.9	12.6	10	13.7	5	-	2.2	60	10	-	-	-	-
- Universities	4.7	2.0	73.1	90	13.7	85	100	95.7	40	90	100	100	100	100
- Institutes of education	1.5	1.0	39.6	75	2.0	70	7.1	9.2	30	50	10	-	-	-
- Humanities	2.5	1.0	25.1	10	6.9	5	21.4	29.7	10	20	90	10	20	20
- Medicine	0.2	-	1.5	1	0.4	-	-	13.5	-	-	-	70	10	-
- Science	0.3	-	3.0	2	-	5	50.0	14.1	-	20	-	20	60	10
- Technology	0.2	-	3.9	2	4.4	5	21.5	29.2	-	-	-	-	10	70
Other education	1.3	0.5 a/	2.8	-	7.7	-	-	0.5	-	-	-	-	-	-
Non specified	1.0	0.3 a/	2.4	-	1.2	-	-	1.6	-	-	-	-	-	-

a/ "Survivors" from 1961.

Table 4-16

NET TEACHING STAFF REQUIREMENTS FOR THE PERIOD 1961-1980, BY EDUCATIONAL LEVEL OF THE TEACHERS

Educational level of the teaching staff	Teaching staff			
	1961		1980	Net requirements 1961 - 1980
	Total	Survivors in 1980		
TOTAL	53,055	32,110	142,460	110,350
PRIMARY	6,775	3,630	3,630	-
SECONDARY	21,305	13,970	16,970	3,000
- GENERAL	19,535	13,060	15,060	2,000
- TECHNICAL	1,770	910	1,910	1,000
ADVANCED	23,475	13,700	121,050	107,350
- TEACHER TRAINING	14,680	9,510	79,080	69,570
- UNIVERSITIES	8,795	4,190	41,970	37,780
- INSTITUTES OF EDUCATION	3,855	2,520	24,925	22,405
- HUMANITIES	3,395	740	6,800	6,060
- MEDICINE	315	170	2,671	2,501
- SCIENCE	495	300	4,222	3,922
- TECHNOLOGY	735	460	3,352	2,892
OTHER EDUCATION	875	480	480	-
NOT SPECIFIED	625	330	330	-

to be produced, and how this educational manpower will attain a higher intellectual standard than the other sectors. The fact that education absorbs part of its own output naturally complicates the forecasts made for the economy as a whole, and also has certain far-reaching implications outside the scope of this survey, but which should certainly be considered in the preparation of an education plan; these are: the reasons people take up teaching, the scientific aptitudes of primary teachers, the role of the teaching profession in the dynamics of social and regional mobility, competition between teaching and other types of employment to obtain highly qualified personnel.

Two other factors are important in primary education when planning educational expansion, namely the extent to which the quality of the teaching affects the educational effort at this level, and the possible impact of the greater use of modern aids. A policy for expanding education must stick to very precise targets to ensure that primary teacher training and refresher courses are carried out coherently. The latest advances in science and technology must be made available to the new generations from primary school onwards, especially in societies whose development effort has a serious leeway to make up.

At secondary level teachers' specialties must also be considered. Educational organisation, the structure of the curriculum and the streaming of the pupils have hitherto influenced the trend in the number of teaching posts for the various specialties. Since the expansion of training centres for secondary teachers was not planned in line with these considerations, discrepancies are likely between the teachers' specialties and the subjects they have to take. However this has not been included in the problems raised by expanding secondary education since national surveys have been made of curricula.

A breakdown of curricula for total school population by branch, specialty, class and stream showed that in 1964, 20 per cent of the teachers in secondary education taught science, 15 per cent taught technical subjects and 65 per cent other subjects. It is to be hoped that this unsatisfactory situation will have improved by 1975, that science will play a more important part, that vocational guidance will be extended to general secondary level, and that more intensive technological training will be given in the second cycle of the technical streams. Taking into account school population estimates for 1975, the following proportions were arrived at: 35 per cent in science, 25 per cent in technical subjects and 40 per cent in others.

On the basis of these hypotheses the net demand for new secondary teachers should average 1,588 a year between 1964 and 1980, i.e. 628 for science, 445 for technological subjects and 515 for others. For the estimated enrolment of 2,300 first-year students in 1970 in the Institutes of Education, there should be approximately 826 in science, 695 in technology, and 779 in other subjects.

The new educational structure and curriculum reform should be defined primarily in the preparation of the 1967-1970 Plan so that teacher requirements can be analysed and a detailed breakdown made by specialty and period. The very general analysis attempted here shows that in the near future serious shortages may occur in the supply of science and technology teachers, with a probable fall in the quality of the teaching. Measures for correcting the exaggerated growth of the faculties of education in the past few years should take into account this lack of science and technology, not forgetting that at present 50 per cent of the work done by students takes place in other faculties, with students taking general subjects, science and the humanities.

At the higher level, as we have already seen, there will be considerable demand for teachers, especially in science, technology and medicine, in that order. It is not simply a question of including the future demand for university teachers in graduate estimates for, apart from a basic education, this career requires additional training, and selection from among the most qualified candidates, on the ground of aptitude, training, experience and vocation. It is unlikely that each university, either on its own or in co-operation with others in Peru or abroad, will find a solution to these problems. The new 1967-1970 Plan must therefore be based on a national programme that will allow the demand resulting from the constant expansion of higher education to be met at inter-university level.

4.3.2. Projection of the administrative and service personnel

The forecasts made here for this staff are no more than first general estimates, requiring adjustment once the structural reform of education has produced some uniformity in its services. The number of administrative and service personnel needed for educational establishments has been calculated, as shown in Table N° 4-17, on the basis of the ratio of the number of pupils to adminis-

Table 4-17

FORECAST OF ADMINISTRATIVE AND MAINTENANCE STAFF IN 1970, 1975 AND 1980

	Pupils per post				Administrative and maintenance posts							
	1964		1970-1980		1964		1970		1975		1980	
	Adm.	Ser.	Adm.	Ser.	Adm.	Ser.	Adm.	Ser.	Adm.	Ser.	Adm.	Ser.
TOTAL					12,735	10,193	15,525	15,530	19,590	19,250	24,110	23,480
ADMINISTRATIVE					1,800	256	1,870	930	2,330	1,170	2,790	1,390
- National					885	176	620	310	780	390	930	460
- Regional					915	80	1,250	620	1,550	780	1,860	930
EDUCATIONAL SYSTEM					10,935	9,937	13,655	14,400	17,260	18,080	21,320	22,090
- Nursery and primary	618	438	600	400	2,972	4,195	4,420	6,630	5,460	8,200	6,400	9,600
- General secondary	56	76	80	100	4,658	3,426	5,785	4,630	7,730	6,180	9,640	7,710
- Technical secondary	44	83	80	100	1,358	719	1,360	1,080	1,660	1,330	2,230	1,780
- Intermediate			30	40			120	90	160	120	190	140
- Teacher training	40	29	60	60	337	458	390	390	430	430	490	490
- Universities	33	48	40	40	1,509	1,051	1,580	1,580	1,820	1,820	2,370	2,370

trative or service posts. Changes in relation to 1964 are mainly intended to correct the excessive increase in the number of administrative posts in secondary education and teacher training in recent years.

At regional level it has been assumed that administrative posts will equal 1 per cent of all posts (teaching, administrative and service) in educational establishments, and that there will be one service post for every two administrative posts. The national administration should have only half as many administrative and service posts as the regional administrations. In short, in educational establishments the number of administrative posts will amount to only 15 per cent of the number of teaching posts, and, in national and regional administration as a whole, will represent only 2 per cent of the number of teaching posts in the entire education system.

4.4. Financial estimates

The forecasts of the expansion of education given in this Chapter represent a considerable effort for which the financial cost must be estimated to see whether it is possible to make this effort and whether the long-term forecasts can serve as a guide when drawing up an overall plan for educational development.

Due to the nature of this report and the scarcity of information available, the cost factor has not been used as a final chapter for assessing the financial implications, but as an analytical planning factor for correcting forecasts, as was done for the age trends of the population, the desirable levels of employments, or the necessary linking up of the different educational levels. This will give a rough estimate of the expenditure required to prepare the country's human resources to take part in its economic ans social development, and in particular to draw up a rational and economically effective educational policy, vitally necessary in economically underdeveloped countries.

In view of the circumstances noted in Chapter 2, this is not an easy task. Since 1963, public expenditure (which represents the larger part of overall expenditure, and is the only part for which details are known) has not been administered according to budget procedure but has been adapted to the needs of planning. This change-over is not yet satisfactory, however, since educational administration has not yet fully exploited the new possibilities offered by the Organic Law on the Functional Budget of the Republic.

From 1965 onwards, staff salaries will be considerably influenced by the new Act concerning teachers' salaries and conditions of service. New pay scales have been introduced, giving substantial progressive increments, including automatic annual adjustments for changes in the cost of living. The complicated nature of the provisions and the vast changes to existing scales have made it impossible to estimate exactly the increase in expenditure for 1965, and even less to draw up the budgetary estimates of expenditure for 1966. The implementation, supervision and evaluation of expenditure for public education encounter serious difficulties, due to the high degree of centralisation, complicated administrative routines and failure to modernise methods.

These circumstances mean that a statistical series wide enough to allow precise cost estimates to be made of educational services is not possible. At the same time, education suffers from considerable infrastructural deficiencies which will have serious short and medium-term financial implications. In addition, the rapid expansion of the education system means that in future priority must be given to solving the present acute problems of imbalance. These adjustments will improve the efficiency of the economy, but are necessarily slow. The fact that the first overall development plan is not yet ready also makes financial estimates difficult, since there is no overall economic context to refer to, no system of priorities, and no precise indication of the liabilities the public sector will assume for each educational programme.

For these reasons we preferred to make a long-term financial forecast, taking 1975 as the year of reference, since by then the present infrastructural deficiencies will probably have been corrected, most of the expansion now required will have been achieved, the more serious discrepancies corrected, and educational services made more homogeneous, so that the difference between the marginal and the average current expenditure will have been substantially reduced. On the other hand, a long-term forecast creates two serious difficulties. As the cost of education is likely to go on increasing in future, and the system to grow larger and more efficient, the extent of the increase becomes more difficult to estimate; teaching methods will probably change considerably, and this also is difficult to predict.

Table 4-18, which shows total enrolment at each level and in each branch for 1975 and 1980, allows us to calculate the average

Table 4-18

ESTIMATE OF THE TOTAL NUMBER OF PUPILS AND CLASSES FOR 1975; ANNUAL INCREASES, BY LEVEL AND BRANCH OF EDUCATION

LEVEL AND BRANCH OF EDUCATION	THOUSANDS OF PUPILS				NUMBER OF PUPILS PER CLASS		NUMBER OF CLASSES IN 1975	
	1975	1980	Increase 1975-1980					
			Total	Annual	1964 a)	1975	Total	Annual increase
TOTAL FOR EDUCATIONAL SYSTEM	4,133.1	4,918.1	785.0	157.0				
- NURSERY AND PRIMARY	3,278.8	3,839.5	560.7	112.1	36.0	40	81,970	2,800
- SECONDARY	751.2	949.1	197.9	39.5		41.3	18,170	1,010
- General	618.3	770.8	152.5	30.5	43.1	45	13,740	680
- Full-time	544.7	681.9	137.2	27.4		45	12,100	610
- Evening classes	73.6	88.9	15.3	3.1		45	1,640	70
- Technical	132.9	178.3	45.4	9.0		30	4,430	330
- Agricultural	20.7	27.5	6.8	1.4	23.9	30	690	50
- Industrial	60.3	90.2	29.9	5.9		26.7	2,260	230
- Boys	38.1	61.8	23.7	4.7	34.7	25	1,520	190
- Girls	22.2	28.4	6.2	1.2	32.3	30	740	40
- Commercial	51.9	60.6	8.7	1.7	41.7	35	1,480	50
- Full time	28.1	32.1	4.0	0.8		35	800	20
- Evening classes	23.8	28.5	4.7	0.9		35	680	30
- INTERMEDIATE	4.7	5.6	0.9	0.2		25	190	10
- HIGHER	98.4	123.9	25.5	5.2				
- Teacher training	25.7	29.2	3.5	0.7	37.7	35	730	20
- Universities	72.7	94.7	22.0	4.5				
- Institutes of education	8.7	8.7	-	-				
- Humanities	24.2	24.2	-	-				
- Medicine	10.3	15.7	5.4	1.1				
- Science	15.4	28.2	12.8	2.6				
- Technology	14.1	17.9	3.8	0.8				

a) Public sector

annual increase in the number of pupils in the five-year period, estimates of the increase for the different classes and groups can then be made, and will serve as a base for estimating subsequent investments. For primary and general secondary schools the same averages of 40 and 45 pupils per class have been used as serve for new school construction. In technical secondary education the average in agriculture is expected to rise to 30 (by eliminating the present disparities which cause a very low average), while averages in industrial (male), industrial (female) and commercial branches are expected to fall to 25, 30 and 35 respectively, since more intensive vocational training will call for a reduction in the average class size.

The second step was to establish average overall estimates of the direct current expenditure per pupil and the direct capital expenditure per class (per student for university education), as shown in Table N° 4-19.

Forecasts of direct current expenditure are based on three factors: the increase in expenditure per pupil, due to the higher cost of education and the need for qualitative improvements; a comparison between levels of expenditure per pupil, to establish relative standards, and the improved distribution of current expenditure among its main end-users (salaries, purchases of premises and equipment, payment for other, non-personal services).

Expenditure per pupil in public primary education is expected to rise from Soles 759 in 1964 to Soles 1,200 in 1975, an increase of 58.1 per cent. Increases are also anticipated for general secondary education (45.5 per cent), technical secondary education (varying between 1.4 and 60.5 per cent) and for university education (between 28 and 28.6 per cent). Only for teacher training is there expected to be a reduction in average expenditure, which is extremely high at present, for the tree following reasons: the large number of small training colleges which are uneconomic because of the high basic costs per student; higher-level training colleges with heavy expenditure on general services; the prevailing residential system. For 1975, forecasts concern primary teacher-training colleges and the many small training colleges are expected to amalgamate to form large regional teacher-training centres, whose increased capacity and efficiency will make them more flexible financially.

With the proposed increase, the direct current expenditure ratio per pupil in general secondary education to that per pupil in

Table 4-19

FORECASTS FOR DIRECT EXPENDITURE PER UNIT, CURRENT AND CAPITAL,
PER PUPIL AND PER CLASS BY LEVEL AND BRANCH OF EDUCATION FOR 1975

(In constant Soles, at 1960 prices)

	Current expenditure					Capital expenditure			
	Per pupil		Breakdown (%)			Per pupil		Per class	
	Absolute figures	Percentages (b)	Salaries	Goods	Services	Building	Equipment	Building	Equipment
TOTAL FOR THE ADMINISTRATION OF THE EDUCATIONAL SYSTEM			90	4	6				
- NURSERY AND PRIMARY	1,340	100	95	3	2			60,000	20,000
- SECONDARY									
- General									
- Full time	3,350	250	88	7	5			90,000	40,000
- Evening classes	3,350	250	88	7	5				
- Technical									
- Agricultural	6,700	500	86	9	5			110,000	95,000
- Industrial									
- boys	8,040	600	82	11	7			140,000	150,000
- girls	5,360	400	88	8	4			120,000	95,000
- Commercial									
- Full time	3,350	250	89	7	4			100,000	90,000
- Evening classes	3,350	250	89	7	4				
- INTERMEDIATE	8,040	600	80	12	8			150,000	85,000
- HIGHER									
- Teacher training	8,040	600	70	20	10			120,000	60,000
- Universities									
- Institutes of education	10,720	800	82	10	8	3,000	2,000		
- Humanities	10,720	800	74	14	12	3,000	2,000		
- Medicine	26,800	2,000	70	16	14	5,000	10,000		
- Science	16,750	1,250	78	12	10	5,000	8,000		
- Technology	23,450	1,750	86	8	6	5,000	9,000		
- MISCELLANEOUS			90	6	4				

(a) Public sector
(b) Base 100 for nursery and primary education

primary school is 2.5: 1; in technical secondary 2.5 - 6.0: 1; in intermediate and teacher training 6.0:1; and 8.0 - 17.3: 1 for university education.

For the breakdown of the direct current expenditure per pupil, overall hypotheses were used tending to reduce the relative share going to wages and salaries, which in 1964 amounted to 93.5 per cent for education as a whole, and continues to increase, to the detriment of the quality of teaching. The remainder, which covers premises and equipment, and other non-personal services, varies according to level and branch. More detailed estimates have not been possible here than the overall figures given in Table N° 4-19. A better approximation would require thorough analyses of the principal cost components, and these will have to form part of the preparatory work on the 1967-1970 Economic and Social Development Plan.

Similar difficulties exist when estimating unit costs for school building and equipment. First, these are necessarily marginal costs, since they concern new accommodation being added to that now existing and they will be greatly affected by future trends in component parts, hardly known at present and not standardised (e.g. the materials and the labour required for construction; the main imports, and variations in exchange rates for part of the equipment), and by possible educational policy measures such as standard designs, or the department producing its own school equipment. The figures for direct capital expenditure in Table N° 4-19 should therefore be regarded as no more than a preliminary estimate, including expenditure normally met by education and the cost of preparatory studies or of other services provided by educational establishments. Analytical cost studies must be made as soon as possible particularly for the universities, and using a common basic methodology which makes allowances for the complex and varied forms of higher education, since the universities are now preparing their overall long-term development programmes, which are to be co-ordinated and brought into line at national level by the National Inter-University Planning Office, a subordinate body of the Inter-University Council. This is very important since, in the short run, the overall plans for developing Peru's universities will represent a large percentage of all investment in education.

Table N° 4-20 shows the amount and end-use of total expenditure on education (both public and private) in 1975 on the basis of the assumed unit costs shown in Table N° 4-19. It is also assumed that, of

Table 4-20

BREAKDOWN OF ESTIMATED EXPENDITURE ON EDUCATION IN 1975 ACCORDING TO THE ECONOMIC CLASSIFICATION FOR NATIONAL AND REGIONAL ADMINISTRATIONS AND BY LEVEL AND BRANCH OF EDUCATION
(millions of constant soles at 1960 prices)

	Total	Direct current expenditure			Indirect current expenditure	Capital expenditure	
		Salaries	Goods	Services		Building	Equipment
TOTAL FOR THE ADMINISTRATION OF THE EDUCATIONAL SYSTEM	10,239.3 a/ 512.0 b/ 9,113.0	8,393.8 460.8 7,748.7	570.5 20.5 537.7	416.9 30.7 378.0	409.5 – –	288.2 – 288.2	160.4 – 160.4
- NURSERY AND PRIMARY	4,617.6	4,173.9	131.8	87.9		168.0	56.0
- SECONDARY	2,966.2	2,452.6	212.9	143.6		93.8	63.3
- General	2,150.6	1,822.8	145.0	103.5		54.9	24.4
- Full time	1,904.0	1,605.8	127.7	91.2		54.9	24.4
- Evening classes	246.6	217.0	17.3	12.3		–	–
- Technical	815.6	629.8	67.9	40.1		38.9	38.9
- Agricultural	149.0	119.3	12.5	6.9		5.5	4.8
- Industrial	489.0	355.9	43.2	26.2		31.4	32.3
- Boys	361.4	251.2	33.7	21.4		26.6	28.5
- Girls	127.6	104.7	9.5	4.8		4.8	3.8
- Commercial	177.6	154.6	12.2	7.0		2.0	1.8
- Full time	97.9	83.7	6.6	3.8		2.0	1.8
- Evening classes	79.7	70.9	5.6	3.2		–	–
INTERMEDIATE	40.2	30.3	4.5	3.0		1.5	0.9
HIGHER	1,489.0	1,091.9	188.5	143.5		24.9	40.2
- Teacher training	210.2	144.6	41.3	20.7		2.4	1.2
- Universities	1,278.8	947.3	147.2	122.8		22.5	39.0
- Institutes of education	93.3	76.5	9.3	7.5		–	–
- Humanities	259.4	192.0	36.3	31.1		–	–
- Medicine	292.5	193.2	44.2	38.6		5.5	11.0
- Science	291.8	201.2	31.0	25.8		13.0	20.8
- Technology	341.8	284.4	26.4	19.8		4.0	7.2
- MISCELLANEOUS	614.3 c/	184.3	12.3	8.2	409.5 d/	–	–

b/ equivalent to 5 % of a/
c/ equivalent to 6 % of a/
d/ equivalent to 4 % of a/

the total current expenditure on education only 89 per cent will be for direct current expenditure incurred by educational establishments at all levels; of the rest a further 4 per cent will be for indirect current expenditure (transfers, liabilities, social security, interest, commission and other charges for financial services); 2 per cent for other expenses (including adult education, special education, out of school training, etc.).

The forecasts do not take into account the amortization of any loans contracted between 1965 and 1975. These forecasts should be incorporated in the preparatory work being done on the financing of short and medium-term educational development for the 1967-1970 Plan.

The breakdown of estimated expenditure in the public sector shows a reduction in the percentage of capital expenditure from 11.5 per cent in 1964 to only 5.0 per cent in 1975. This is because the deficiencies existing in 1964 should have been made good by 1975, and the school expansion phase completed. On this basis short and medium-term investments would best be financed by long-term development loans, at a low rate of interest and with a long period of grace. In counterpart, the country will make a considerable effort to cover current expenditure. If, however, the contribution from foreign sources were fixed at 50 per cent of total investments, or at 60 per cent or more for selected investment projects, education's possibilities of help from foreign loans would be very limited. In view of this, should the authorities wish to encourage private education, state aid would go mainly to investments. The ratio between marginal current capital expenditure is so high that the possible effects should be considered when policy for financing educational development is defined in the 1967-1970 Plan.

Under direct current expenditure "wages and salaries" will fall relatively from 93.5 per cent in 1964 to 90.0 per cent in 1975, whereas "purchase of premises and equipment" will rise from 2.9 to 5.8 per cent, and "Payment for other non-personal services" from 3.6 to 4.2 per cent. These changes have been suggested to improve the quality of education.

If total expenditure on education in 1975 (Table N° 4-20) is expressed as a percentage of estimated gross domestic product for the corresponding year (see Chapter 3), expenditure on education rises from 5.7. per cent of GDP in 1964 to 7.0 per cent in 1975, and to only 5.6 per cent in 1980. Although these percentages depend on the macro-economic forecasts, which are to be revised during the preparation of the 1967-1970 Plan, they give some idea of the relative financial effort to be made.

When compared with similar estimates for other countries in Latin America or elsewhere, the figure of 7.0 per cent for 1975 appears high, in view of the present level, but is in line with the forecasts made by other countries. The more detailed financial studies made as part of the preparatory work on the 1967-1970 Plan will answer these conjectures and queries and will be used for defining policy for financing education, particularly in the short and medium-term. The estimates given here, however, indicate that a vigorous long-term financial programme for developing education is possible and would satisfy the human resource requirements implied in the targets of economic and social development targets which seem the most obvious for Peru in present circumstances.

NOTE ON THE ANNEXES TO THIS EDITION

Annexes to Chapter 2

The original edition in Spanish has 109 pages of annex to Chapter 2. Here we reproduce only the following:

A. General information on the education and human resources sector in Peru: its place in the national planning organisation, system of educational administration and educational structure.
(p. 327)

B. A table illustrating the summary economic classification of public expenditure on education on an annual basis, as used by the Ministry of Education and the national universities, for 1965.
(p. 331)

C. A table illustrating the analysis, on an annual basis, of direct current public expenditure, as a whole and by student, for 1965.
(p. 339)

The original edition contained 40 pages of statistical data on the student population, by level, field and years of study, sex, type of administration (public, subsidised, or private education), and type of education (full-time or evening classes), for each year from 1955 to 1964. All this information was analysed and completed by interpolations made by the study team, on the basis of published or unpublished information supplied by the Educational Statistics Division of the Ministry of Education.

A similar procedure was followed for the university statistics (which account for 21 pages in the original edition) on the basis of unpublished information gathered by the National Inter-University Planning Board for the years 1960 to 1964.

Further information on demographic data, educational and financial censures collected and analysed by the study group, have been relegated to the annexes so as not to overload the report itself. They have, however, been incorporated so as to present in a single volume all the material used and prepared mainly for the internal distribution of the report.

Annexes to Chapter 3

All the annexes to the original text have been reproduced here, owing to their methodological interest and the figures they contain.

Annex 3.I	Proposed special programme for three-dimensional tabulation of the active population, based on the results of the Sixth Population Census, 1961. (p. 344)
Annex 3.II	Stratification of the population census sample of 1961, by economic activities. (p. 346)
Annex 3.III	A - Classification of economic activities. (p. 347) B - Classification of occupational categories. (p. 349) C - Classification of levels education. (p. 353)
Annex 3.IV	Distribution of the active population by occupational category and level of education in each sector of economic activity. (p. 355)
Annex 3.V	Breakdown of the active population by occupational category and level of education for each economic sector. Economic sector 00 Economic sector 01 Economic sector 10 Economic sector 20

Economic sector 21
Economic sector 22

Economic sector 23
Economic sector 24

Economic sector 30
Economic sector 40

Economic sector 50
Economic sector 51

Economic sector 52
Economic sector 53

Economic sector 54
Economic sector 55

Economic sector 90

There follows a complete list of the annexes to the original edition in Spanish published by the National Planning Institute, for reference purposes.

(pp. 356 to 372)

STATISTICS USED IN THE REPORT, CLASSIFIED UNDER THEIR HEADINGS

	Table N°	Page in national version	Page in present edition
Gross Domestic Product			
- Years 1950, 1955, 1960, 1965, 1970, 1975, 1980	3-01	3-03	148
- Years 1950, 1955, 1960, 1964	3-03	3-07	153
By sectors, see	Annexes 2-64 and 3-03		
- Manufacturing industries sectors Years 1961, 1965, 1970, 1975, 1980 (by sub-sectors)	3-06	3-13	160
- Years 1965, 1970, 1975, 1980 (by sectors)	3-07	3-19	170
- Years 1961, 1980 (by sectors)	3-12	3-28	184
- Manufacturing industries sectors Years 1961, 1980 (by sub-sectors)	3-17	3-37	194
Population			
- Years 1950, 1955, 1960, 1965, 1970, 1975, 1980	3-01	3-03	148
- Years 1961, 1980 (age groups 10-14, 15-19, 20-29, 30-44, 45-64 and over) (total, men, women)	3-11	3-25	178
- Years 1955, 1960, 1965, 1970, 1975, 1980 (age groups 5-9, 10-14, 15-19, 20-24) (total, men, women)		Annex 2-77	

	Table N°	Page in national version	Page in present edition
Activity rate			
- Years 1961, 1980 (age groups 10-14, 15-19, 20-29, 30-44, 45-64, 65 and over) Total men, women	3-11	3-25	178
Productivity			
- Years 1950, 1955, 1960, 1965, 1970, 1975, 1980	3-01	3-03	148
- Years 1961, 1980 (by sectors)	3-12	3-28	184
- Manufacturing industries sectors Years 1961, 1980 (by sub-sectors)	3-17	3-37	194
- Manufacturing industries sectors Year 1963 (by sub-sectors) (Firms of 1-10, 10-49, 50-99, 100-199, 200-399, 400 workers and over)	3-18	3-39	197
- Manufacturing industries sectors Year 1963 (81 groups of 3 establishments) (by sub-sectors)	3-30	3-69	234
Bi-monthly tabulation of manpower in 1961			
- Occupational categories and economic sectors		Annex 3-04	
- With the 2nd cycle of technical secondary education	2-09	2-43	83
- Total (absolute figures)	3-21	3-47	206
- Total (relative figures)	3-22	3-48	207
- Scientific and technical personnel	3 -23	3-50	209
- Occupations and level of education		Annex 3-07	

	Table N°	Page in national version	Page in present edition
- Total (relative figures)	3-25	3-56	216
- For each sector of economic activity (relative figures)	Annexes 3-11 to 3-19		
- Level of education and economic sectors (relative figures)		Annex 3-10	
Other statistics concerning the structure of manpower in 1961			
- By sector			
(percentage for men; percentage for urban zones);			
(percentage for age groups: 0-14 15-24, 25-44, 45 and over)	3-20	3-45	203
- By occupational category			
(percentage for men; percentage for urban zones);			
(percentage for age groups: 0-14 15-24, 25-44, 45 and over)	3-24	3-53	212
- Level of education			
(by occupational category) (men, women) (urban zones) (rural zones) (age groups: 0-14, 15-24, 25-44, 45 and over)	3-26	3-59	219
- Average number of years'study (by occupational categories)	3-39	3-91	256
Manpower forecast for 1980			
- Occupational breakdown in each sector			
- Total (absolute figures)	3-28	3-63	224
- Total (relative figures)	3-29	3-64	225

	Table N°	Page in national version	Page in present edition
- Year 1963 (manufacturing industries sector, 81 groups of 3 establishments) (by sub-sectors); (by level of productivity: high, low, average)	3-30	3-69	234
- Manufacturing industries sectors (by sub-sectors) (absolute figures, relative figures)	3-31	3-72	237
- Survivors of the 1961 labour force			
- by occupational category	3-32	3-76	241
- by occupational category and level of education	3-33	3-78	243
- New entrants 1961-1980, by occupational category and educational structure			
- Total (absolute figures)	3-36	3-82	249
- Total (relative figures)	3-37	3-88	254
- By occupational category and level of education (relative figures)	3-38	3-90	255
- Average number of years study (by occupational category)	3-39	3-91	256

General classification of statistics of enrolment forecasts applicable to all the following figures, unless otherwise stated.

- Total
  - Administration
    - National
    - Regional
  - Educational system
    - Nursery
    - Primary
    - Secondary
      - General
        - full time
        - evening classes
      - Technical
        - Agricultural
        - Industrial
          - Men
          - Women
      - Commercial
        - full time
        - evening classes
- Intermediate
- Higher
  - Teacher training
  - Universities
    - Institutes of education
    - Humanities
    - Medicine
    - Science
    - Engineering
  - Other education
- Out-of-school training

	Table N°	Page in national version	Page in present edition
Certificate holders and graduates			
- Period 1961-1980 (activity concerning economic, continuation of study, or inactivity)	4-01	4-04	262
- Branches of secondary technical education (periods 1961-64, 1961-80)	4-02	4-06	265
- Periods 1961-80, 1961-66, 1967-70, 1971-75, 1976-80	4-03	4-07	266
- Secondary technical education years 1959 to 1964 (by branch and speciality)		Annex 2-86	
- Elementary proficiency technical certificate, years 1959 to 1964 (by branch and speciality)		Annex 2-87	
Final year enrolment			
- Years 1964, 1967, 1970, 1975, 1980	4-06	4-15	275
- Years 1955 to 1964		Annex 2-01 to 2-62	
- Industrial sector -men- (by speciality)			
Years 1963, 1964		Annex 2-84	
- Industrial sector -women- (by speciality)			
Years 1963, 1964		Annex 2-85	
Pass rates			
- Years 1964, 1970, 1975, 1980	4-05	4-12	271

	Table N°	Page in national version	Page in present edition
First-year enrolment			
- Years 1964, 1966	4-04	4-10	269
- Years 1964, 1967, 1970, 1975, 1980	4-07	4-18	279
- Years 1955 to 1964		Annexes 2-01 to 2-62	
- Industrial sector -men- (by speciality) Years 1963, 1964		Annex 2-84	
- Industrial sector -women- (by speciality) Years 1963, 1964		Annex 2-85	
- Universities (by speciality) Years 1960 to 1964		Annex 2-89	
Gross continuation coefficients			
- Years 1970, 1975, 1980	4-13	4-28	293
- Years 1960 to 1964		Annex 2-98	
Total enrolment			
- Years 1955 to 1964	2-04	2-12	49
- Years 1964, 1967, 1970, 1975, 1980	4-08	4-19	280
- Years 1955 to 1964		Annexes 2-01 to 2-62	
- Industrial sector -men- (by speciality) Years 1963, 1964		Annex 2-84	
- Industrial sector -women- (by speciality) Years 1963, 1964		Annex 2-85	
- Universities (by speciality) Years 1955 to 1964		Annex 2-88	

	Table N°	Page in national version	Page in present edition
Enrolment per class			
- Years 1955 to 1964	Annexes 2-01 to 2-62		
- Industrial sector -men- (by speciality) Years 1963, 1964		Annex 2-84	
- Industrial sector -women- (by speciality) Years 1963, 1964		Annex 2-85	
Breakdown by age of the school population			
- Years 1970, 1975, 1980 (Percentage of age group 0-4, 5-9, 10-14, 15-19, 20-24, 25-29, 30, and over)	4-11	4-25	289
- Years 1961, 1964 (percentage of age groups 0-4, 5-9, 10-14, 15-19, 20-24, 25-29, 30-34, 35-39, 40 and over)		Annex 2-92	
- Men - Years 1961, 1964 (percentage of age groups 0-4, 5-9, 10-14, 15-19, 20-24, 25-29, 30-34, 35-39, 40 and over)		Annex 2-93	
- Women - Years 1961, 1964 (percentage of age groups 0-4, 5-9, 10-14, 15-19, 20-24, 25-29, 30-34, 35-39, 40 and over)		Annex 2-94	
Enrolment indices			
- Primary - Years 1964, 1970 - by age, from 5 to 19 years, total, men, women Total years 1975, 1980	4-09	4-22	286

	Table Nº	Page in national version	Page in present edition
- Years 1970, 1975, 1980 (age-groups 0-4, 5-9, 10-14, 15-19, 20-24, 25-29)	4-12	4-26	290
- Years 1961, 1964 (by age, from 5 to 29 years)		Annex 2-95	
- Men - Years 1961, 1964 (by age, from 5 to 29 years)		Annex 2-96	
- Women - Years 1961, 1964 (by age, from 5 to 29 years)		Annex 2-97	
Number of pupils per teacher			
- Years 1964 (gross, adjusted), 1980	4-14	4-31	295
- Years 1960 to 1964		Annex 2-101	
Number of pupils per administrative post and per service post in the educational system			
- Year 1964, period 1970-1980	4-17	4-37	302
Ratio of national to regional administrative post			
- Period 1970-1980		4-36	301
		paragraph 4.3.2.	
Number of pupils per class			
- Year 1964 (official), 1975	4-18	4-40	305
Teaching staff			
- Years 1955 to 1964	2-10	2-47	88
- Years 1964 (adjusted), 1970, 1975, 1980	4-14	4-31	295

	Table n°	Page in national version	Page in present edition
- Years 1960 to 1964 (men, women)		Annex 2-99	
- Years 1960 to 1964 (public and private education)		Annex 2-100	
- Year 1961 (teacher training college, educators and others) (percentage age groups 15-24, 25-44, 45 and over)	2-12	2-50	91
- Educational structure (year 1961)	2-11	2-49	90
- Educational structure (years 1961, 1980)	4-15	4-33	298
- Survivors from 1961 active in 1980, and net requirements 1961-1980	4-16	4-34	299
Administrative and service personnel			
- Year 1964	2-13	2-58	101
- Years 1964, 1970, 1975, 1980	4-17	4-37	302
Estimate of the total number of pupils and classes by level and branch of education			
- Year 1975	4-18	4-40	305
General classification of expenditure on education Applicable to all the following figures unless otherwise shown			
- Total			
- Current expenditure			

	Table N°	Page in national version	Page in present edition
- Direct - Salaries - Expenditure on material - Services - Indirect - Capital expenditure - Direct - Construction - Equipment - Indirect			
Unit costs			
- Direct current expenditure by pupil (state education)			
- Years 1963, 1964, 1965	2-16	2-83	130
- Year 1975 (by pupil, by class)	4-19	4-41	307
- Year 1963 (current expenditure by pupil)		Annex 2-107	
- Year 1964 (current expenditure by pupil)		Annex 2-108	
- Year 1965 (current expenditure by pupil)		Annex 2-109	
Expenditure			
- Years 1960 to 1965 (state and private education)	2-14	2-73	119
- Years 1963, 1964, 1965 (state education)	2-15	2-76	123
- Year 1975 (by level and branch of education)	4-20	4-44	309
- Year 1963 (Ministries, national universities)		Annex 2-104	
- Year 1964 (Ministries, national universities)		Annex 2-105	
- Year 1965 (Ministries, national universities)		Annex 2-106	

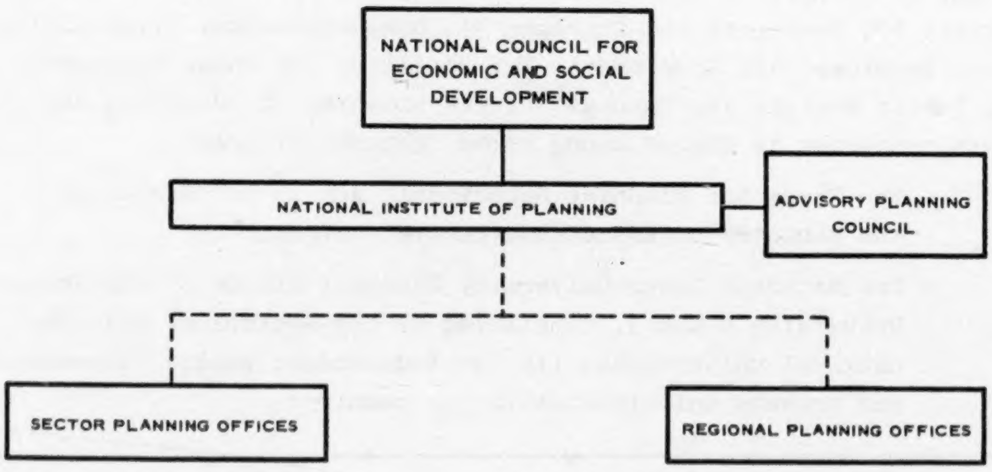
	Table N°	Page in national version	Page in present edition
Public expenditure on education compared with gross domestic product and with total public expenditure			
- Years 1960 to 1965	2-14	2-73	119
- Year 1975 (percentage of gross domestic product)		4-45	202

A. THE PLACE OF THE EDUCATION AND HUMAN RESOURCES SECTOR IN THE NATIONAL PLANNING ORGANISATION

The national planning system was set up by the Order in Council No. 14220, of 19th October, 1962. Its supreme authority is the National Council for Economic and Social Development, presided over by the President of the Republic, and is composed of the Ministers for Economic and Social Affairs (Finance and Trade, Development and Public Works, Education, Public Health and Social Assistance, Agriculture, Labour and Home Affairs), a Minister of the Armed Forces and the Director of the National Planning Institute. The National Planning Institute is the central technical body. It forms part of the President's Office, and its Director has the rank of Minister of State. The private sector is represented in the planning system at national level through the Advisory Planning Council, with a membership of 20, presided over by the Director of the National Planning Institute. Sectoral Planning Offices, as they are usually called, have been established in the Ministries, Corporations and other important public bodies. There are now 12 of these Offices. The first Regional Planning Office was set up recently on an experimental basis.

Diagram 1

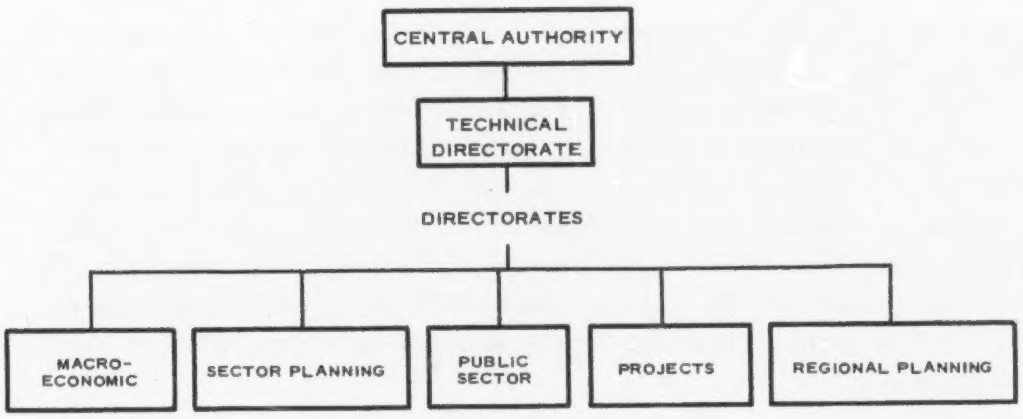
NATIONAL PLANNING SYSTEM


NATIONAL COUNCIL FOR ECONOMIC AND SOCIAL DEVELOPMENT
NATIONAL INSTITUTE OF PLANNING
ADVISORY PLANNING COUNCIL
SECTOR PLANNING OFFICES
REGIONAL PLANNING OFFICES

The National Planning Institute is responsible for formulating the development plan and programmes, preparing and supervising their execution, and evaluating the results. For this purpose, the Institute set up five Directorates. An Education and Human Resources Programming Office was also established, responsible to the Sectoral Planning Directorate.

Diagram 2

NATIONAL INSTITUTE OF PLANNING



The National Planning Institute has classified the Peruvian economy into 16 production sectors, viz:

1. Agriculture; 2. Fishing; 3. Mining; 4. Manufacturing; 5. Construction; 6. Energy; 7. Commerce; 8. Banking and Insurance; 9. Real estate; 10. Transport and Storage; 11. Communications; 12. Miscellaneous Services; 13. Government; 14. Education and Human Resources; 15. Public Health; 16. Tourism(1). The planning of education and human resources is shared among three Sectoral Offices:

- The Education Planning Department, set up in 1958 under the Ministry of Education (Central Government);
- The National Inter-University Planning Office of the Inter-University Council, consisting of the Rectors of all the national universities (in the independent public sub-sector) and private universities in the country;

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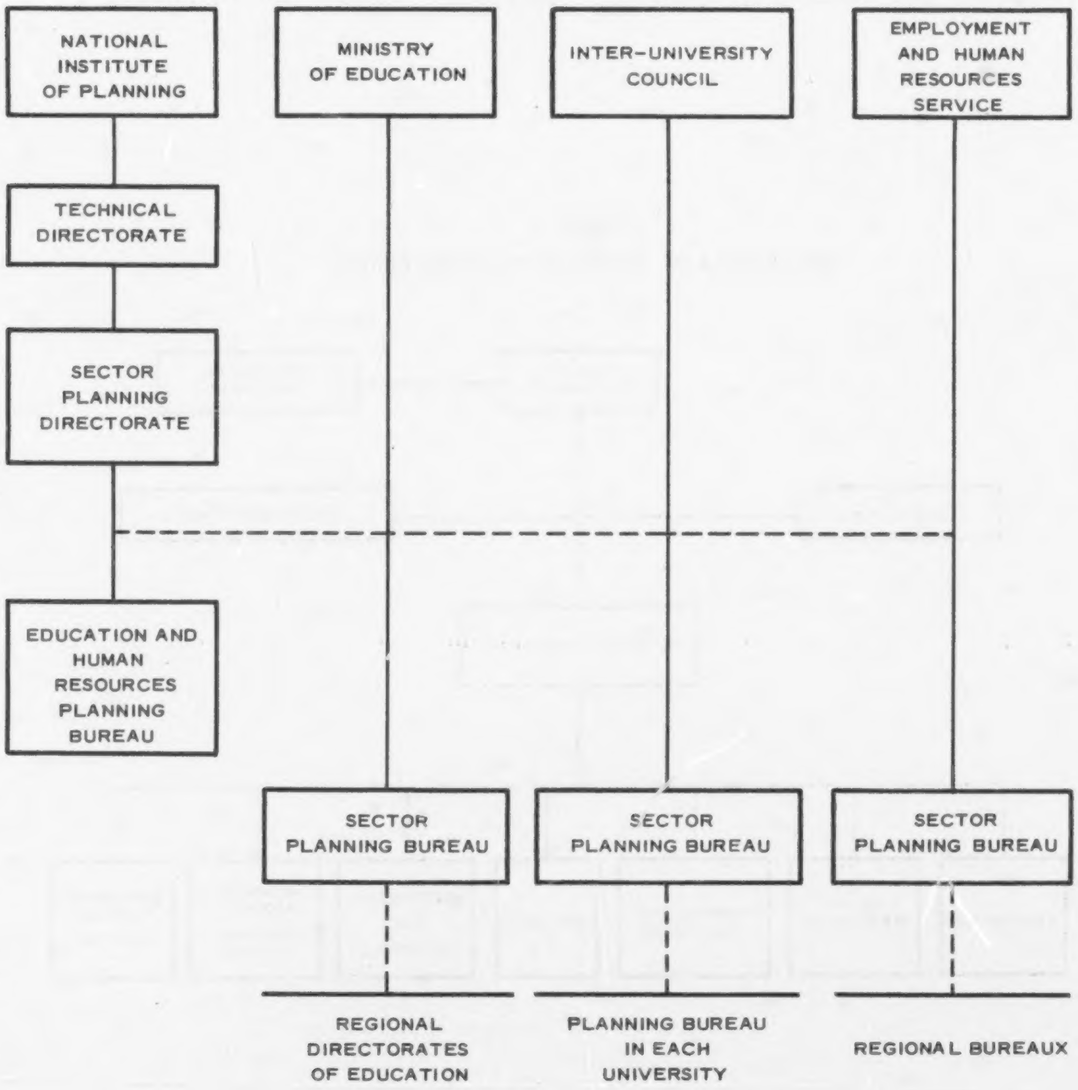
(1) Breakdown of the Peruvian economy by production sectors DP - MACRO/1-65, 15th February, 1965.

- An Office of the Employment and Human Resources Services (in the independent public sub-sector). This body is closely co-ordinated with the Ministry of Labour and Home Affairs.

Diagram 3

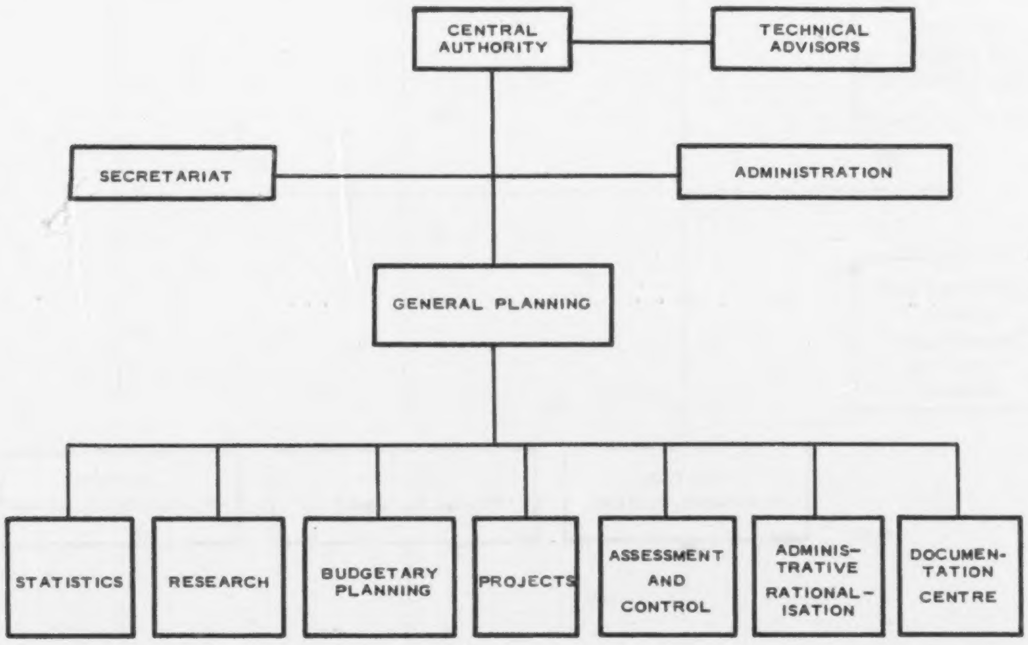
ORGANIGRAM SHOWING THE RELATIONSHIP BETWEEN THE PLANNING DEPARTMENT OF THE EDUCATION AND HUMAN RESOURCES SERVICE, AND THE NATIONAL PLANNING INSTITUTE


NATIONAL INSTITUTE OF PLANNING
MINISTRY OF EDUCATION
INTER-UNIVERSITY COUNCIL
EMPLOYMENT AND HUMAN RESOURCES SERVICE
TECHNICAL DIRECTORATE
SECTOR PLANNING DIRECTORATE
EDUCATION AND HUMAN RESOURCES PLANNING BUREAU
SECTOR PLANNING BUREAU
SECTOR PLANNING BUREAU
SECTOR PLANNING BUREAU
REGIONAL DIRECTORATES OF EDUCATION
PLANNING BUREAU IN EACH UNIVERSITY
REGIONAL BUREAUX

These three sectoral offices work in conjunction with the National Planning Institute through the Sectoral Planning Department and its Education and Human Resources Programming Office. Their regional representation is as follows: the Ministry of Education is represented by the Regional Department of Education; the Inter-University Council by the University Planning Boards; the Employment and Human Resources Department by three Regional Offices in provincial towns.

The organisation of the Sectoral Planning Offices varies according to the economic and social sectors for which they are responsible. Generally speaking, they all include the following :

Diagram 4
ORGANIGRAM OF A SECTOR PLANNING BUREAU


CENTRAL AUTHORITY
TECHNICAL ADVISORS
SECRETARIAT
ADMINISTRATION
GENERAL PLANNING
STATISTICS
RESEARCH
BUDGETARY PLANNING
PROJECTS
ASSESSMENT AND CONTROL
ADMINISTRATIVE RATIONALISATION
DOCUMENTATION CENTRE

The Committee of Technical Advisers is the sectoral equivalent of the National Advisory Council. The General Programming Officer is the counterpart of the Technical Director in the National Planning Institute (in most cases the Director of the Sectoral Office himself fulfils the function of General Programming Officer). The Statistics Service collects, compiles and analyses the statistical series; in some cases this service consists only of a statistical analysis unit. It is not uncommon for the study and research services to be associated with the statistical services; units are sometimes formed to carry out special studies, or stimulate or orientate the essential research work for sectoral planning. The budget programming service co-ordinates the preparation of the annual budgets for the public sectors and studies methods of costing and financing. The projects sector is concerned with investment programming and assessment. The evaluation and control service is required to keep the diagnostic studies constantly up-to-date and prepare technical reports on the general progress of the programmes and plans for sectoral development. The service for administrative rationalisation appraises and adjusts administrative procedure in the sector. The documentation centre contains technical card indexes, reference sources and advisory and publishing services.

B. STRUCTURE OF EDUCATIONAL ADMINISTRATION

Article 71 of the Constitution of the Republic specifies that the technical management of education is a matter for the State. The State performs this function by administering public education and supervising private education through the Ministry of Education. Since the promulgation of Act No. 9359 in 1941 (Organic Law on National Education), the structure of the Ministry of Education has been constantly modified by the annual budget acts. When the decentralization of educational administration began in 1962, the Ministry of Education reformed its own structure by progressively delegating part of its functions and administrative responsibilities to the Regional Education Departments, while retaining the general administration of education, the planning of educational programmes and the formulation of educational policy for approval by the National Council of Education.

Administrative decentralization originated in the Order in Council No. 14209 of 28th September, 1962, establishing the Regional Departments of Education. They were increased from four to six by the Order in Council No. 14374 of 17th January, 1963, to seven by Act No. 14754 of 11th December 1963, and to eight by Act No. 14986 - Annual Budget Act of 23rd March, 1964.

Diagram 5

MINISTRY OF EDUCATION

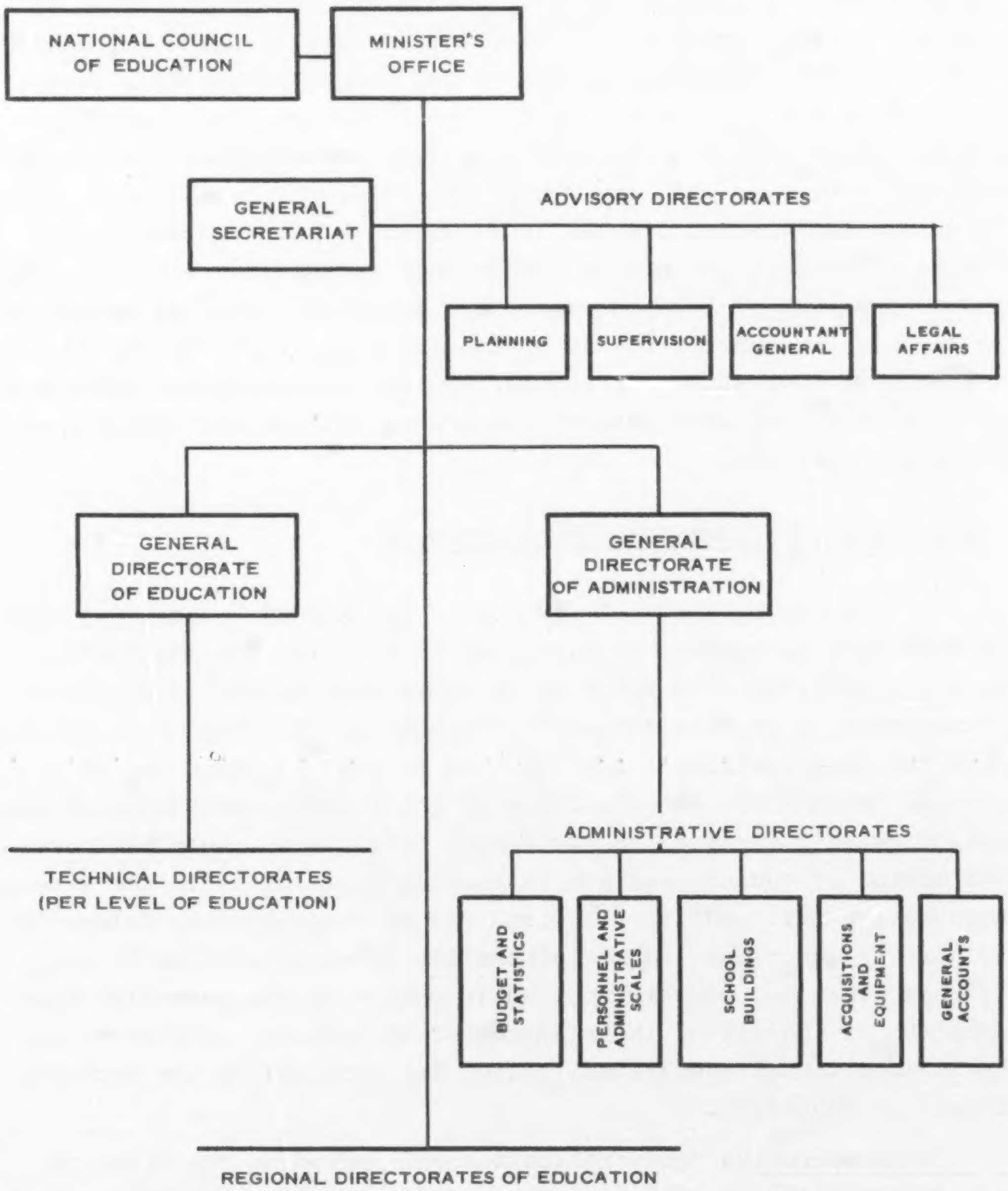

NATIONAL COUNCIL OF EDUCATION
MINISTER'S OFFICE
GENERAL SECRETARIAT
ADVISORY DIRECTORATES
PLANNING
SUPERVISION
ACCOUNTANT GENERAL
LEGAL AFFAIRS
GENERAL DIRECTORATE OF EDUCATION
GENERAL DIRECTORATE OF ADMINISTRATION
TECHNICAL DIRECTORATES (PER LEVEL OF EDUCATION)
ADMINISTRATIVE DIRECTORATES
BUDGET AND STATISTICS
PERSONNEL AND ADMINISTRATIVE SCALES
SCHOOL BUILDINGS
ACQUISITIONS AND EQUIPMENT
GENERAL ACCOUNTS
REGIONAL DIRECTORATES OF EDUCATION

Diagram 6

ORGANIGRAM OF A REGIONAL DIRECTORATE OF EDUCATION

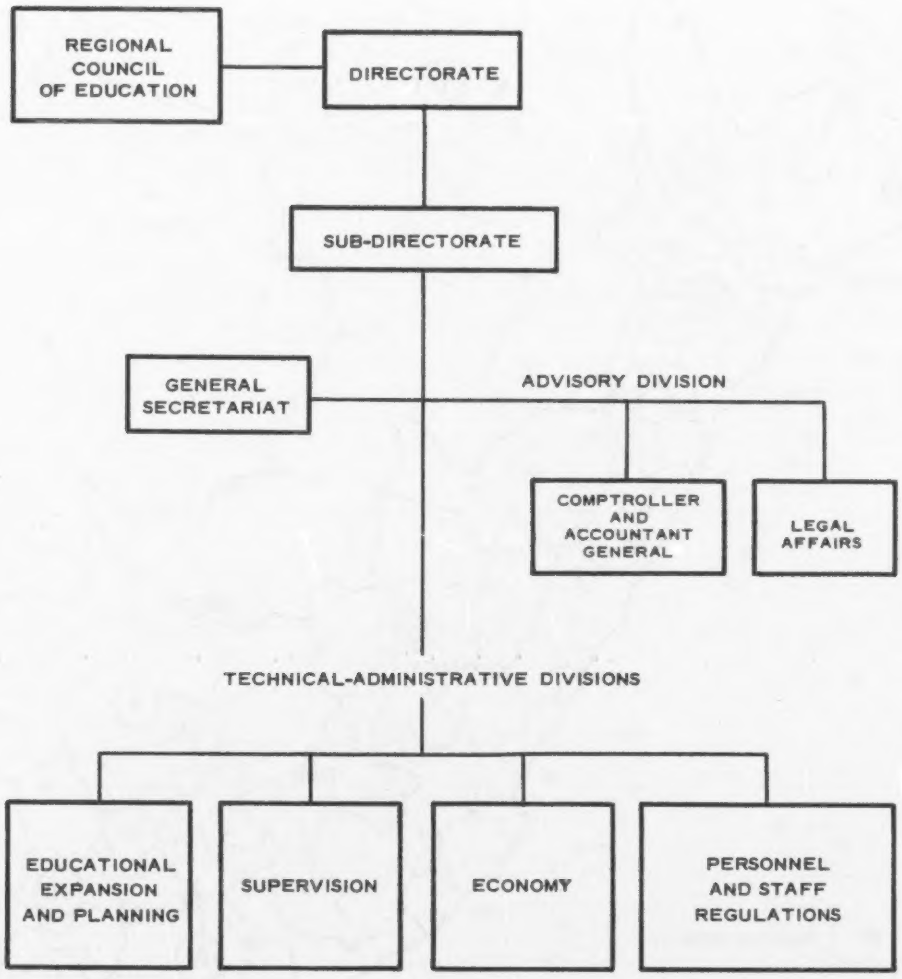
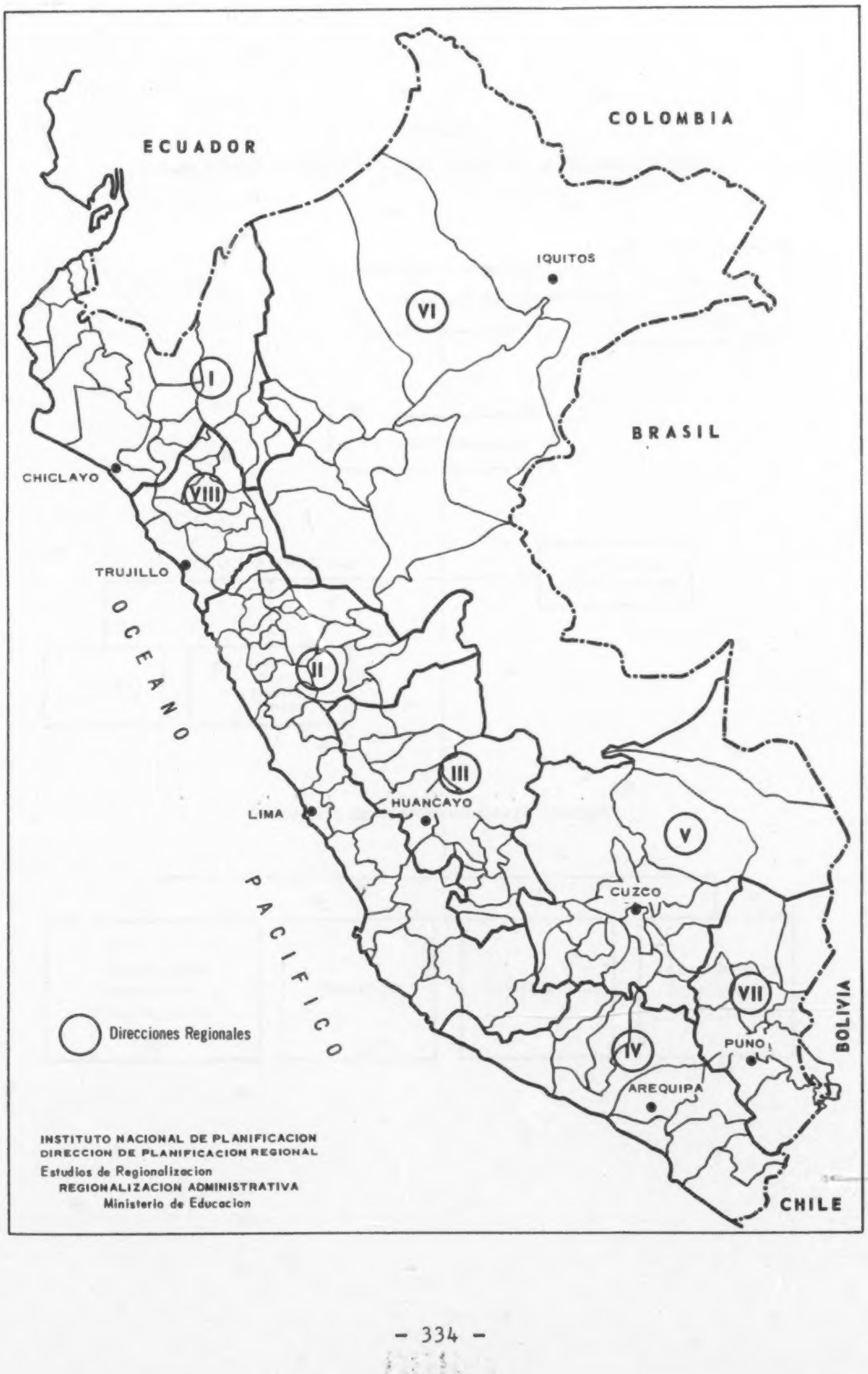

REGIONAL COUNCIL OF EDUCATION
DIRECTORATE
SUB-DIRECTORATE
GENERAL SECRETARIAT
ADVISORY DIVISION
COMPTROLLER AND ACCOUNTANT GENERAL
LEGAL AFFAIRS
TECHNICAL-ADMINISTRATIVE DIVISIONS
EDUCATIONAL EXPANSION AND PLANNING
SUPERVISION
ECONOMY
PERSONNEL AND STAFF REGULATIONS

Diagram 7

ADMINISTRATIVE REGIONS IN PERU


ECUADOR
COLOMBIA
IQUITOS
VI
I
BRASIL
CHICLAYO
VIII
TRUJILLO
OCEANO
II
III
HUANCAYO
LIMA
V
PACIFICO
CUZCO
VII
BOLIVIA
Direcciones Regionales
IV
PUNO
AREQUIPA
CHILE

INSTITUTO NACIONAL DE PLANIFICACION
DIRECCION DE PLANIFICACION REGIONAL
Estudios de Regionalizacion
REGIONALIZACION ADMINISTRATIVA
Ministerio de Educacion

Regulations were issued, prescribing the lines of organisation of the Regional Departments; but the 1963, 1964 and 1965 budget acts made no provision for the funds required to set up a Division for the Extension and Planning of Education in each Department.

The Universities Act No. 13417 of 8th April, 1960, established the educational, administrative and economic autonomy of the universities. It provides for management by the professors, students and graduates. The professors and students elect the university authorities by direct, mandatory, secret ballot. The national Universities belong to the independent public sub-sector, but maintain working relations with the Ministry of Education. Among other general services, each university has a Planning Board, generally under the direction of the Vice-Rector.

Diagram 8

ADMINISTRATIVE ORGANIGRAM OF A UNIVERSITY

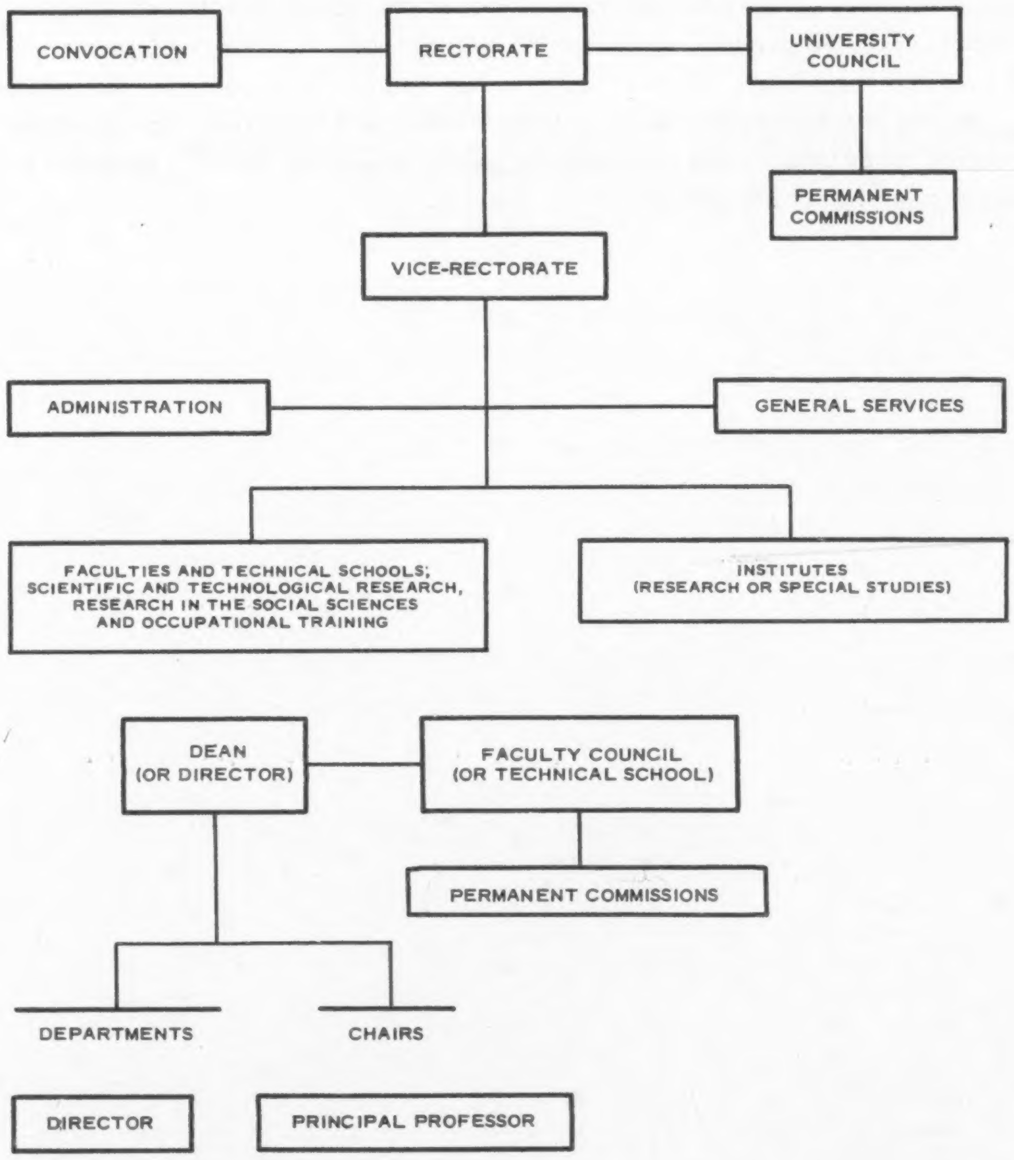
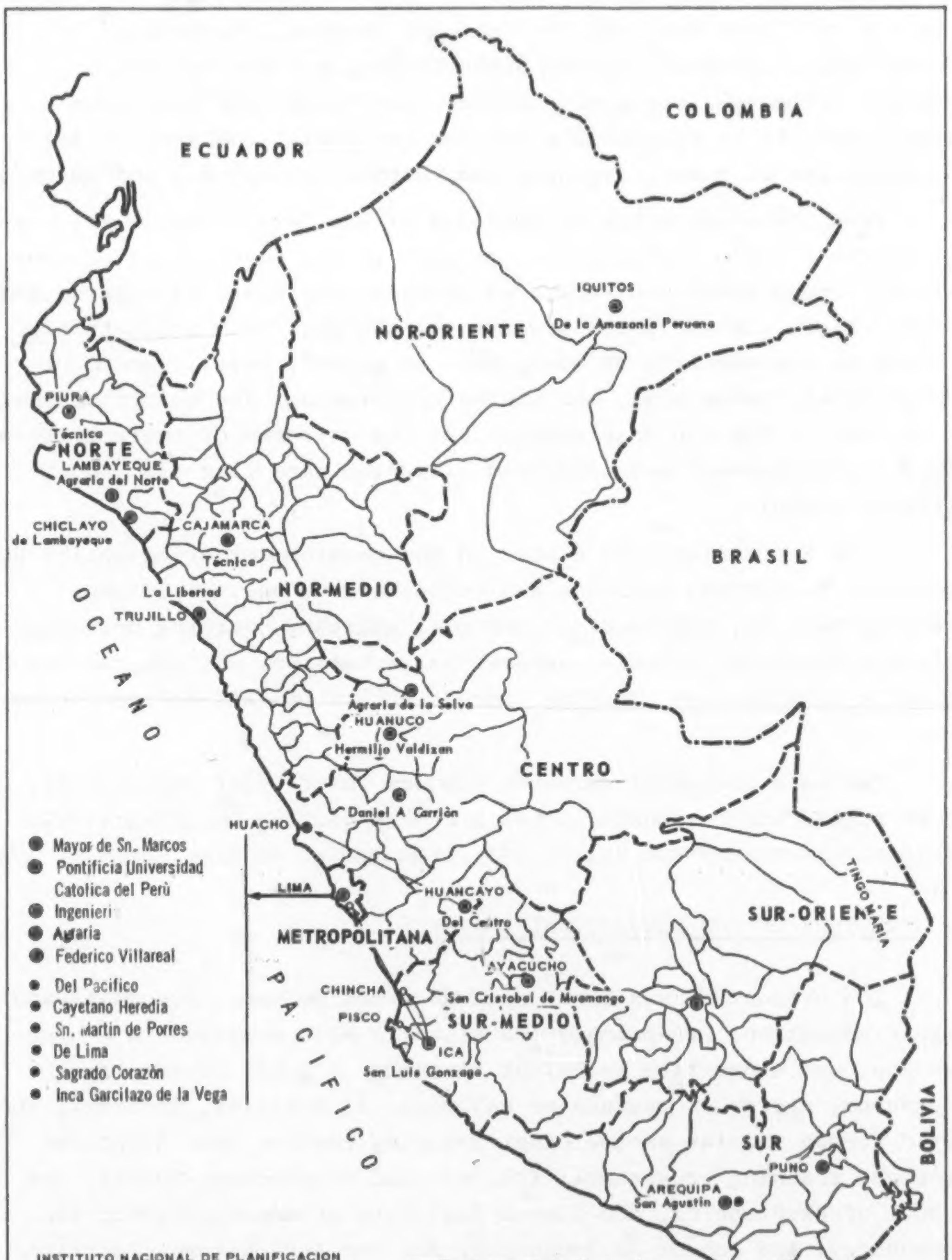

CONVOCATION
RECTORATE
UNIVERSITY COUNCIL
PERMANENT COMMISSIONS
VICE-RECTORATE
ADMINISTRATION
GENERAL SERVICES
FACULTIES AND TECHNICAL SCHOOLS; SCIENTIFIC AND TECHNOLOGICAL RESEARCH, RESEARCH IN THE SOCIAL SCIENCES AND OCCUPATIONAL TRAINING
INSTITUTES (RESEARCH OR SPECIAL STUDIES)
DEAN (OR DIRECTOR)
FACULTY COUNCIL (OR TECHNICAL SCHOOL)
PERMANENT COMMISSIONS
DEPARTMENTS
CHAIRS
DIRECTOR
PRINCIPAL PROFESSOR

Diagram 9

REGIONAL MAP OF PERUVIAN UNIVERSITIES


ECUADOR
COLOMBIA
BRASIL
BOLIVIA
CHILE
IQUITOS
De la Amazonia Peruana
NOR-ORIENTE
PIURA
Técnica
NORTE
LAMBAYEQUE
Agraria del Norte
CHICLAYO
de Lambayeque
CAJAMARCA
Técnica
La Libertad
TRUJILLO
NOR-MEDIO
OCEANO
Agraria de la Selva
HUANUCO
Hermilio Valdizan
CENTRO
Daniel A Carriòn
HUACHO
LIMA
HUANCAYO
Del Centro
METROPOLITANA
TINGO MARIA
SUR-ORIENTE
AYACUCHO
San Cristobal de Huamanga
CHINCHA
PISCO
SUR-MEDIO
ICA
San Luis Gonzaga
PACIFICO
SUR
PUNO
AREQUIPA
San Agustin
● Mayor de Sn. Marcos
● Pontificia Universidad Catolica del Perù
● Ingenieria
● Agraria
● Federico Villareal
● Del Pacifico
● Cayetano Heredia
● Sn. Martin de Porres
● De Lima
● Sagrado Corazòn
● Inca Garcilazo de la Vega
INSTITUTO NACIONAL DE PLANIFICACION
DIRECCION DE PLANIFICACION REGIONAL
Estudios de Regionalizacion
Universidades del Pais
1965
20 ● Universidades Nacionales
● Universidades Privadas
● Filial
○ Algunas Facultades

The various bodies concerned with cultural development and dissemination were recently combined in a national scheme for cultural development, under Act No. 15624. The scheme pertains to the independent public sub-sector and is in charge of the Higher Council for Cultural Development. The National Cultural Institute is responsible for the State Museums, The National Theatre, the National Archaeological Foundation, the State Choirs, and the National Symphony Orchestra; regional cultural institutes have also been established, to be responsible for the provincial Colleges of Arts and Academies of Music, symphony and chamber orchestras, and museums.

Free State education is provided at all levels and in all subjects. The private sector plays its part in the development of education through government-approved schools, colleges, institutes and universities, some of which are free of charge. Their accounts are audited by the Ministry of Education. At primary level, owners of agricultural, industrial, and mining undertakings are constitutionally obliged to finance free schools for the children of their employees; these "fiscalizadas" are organised along the same lines as the official schools.

Other Ministries play a part in the development of education by providing in-service training and refresher courses, vocational training centres, para-medical schools, military training colleges, telecommunications schools, seminaries, a training college for the diplomatic service, and training courses in prisons and reformatories, etc.

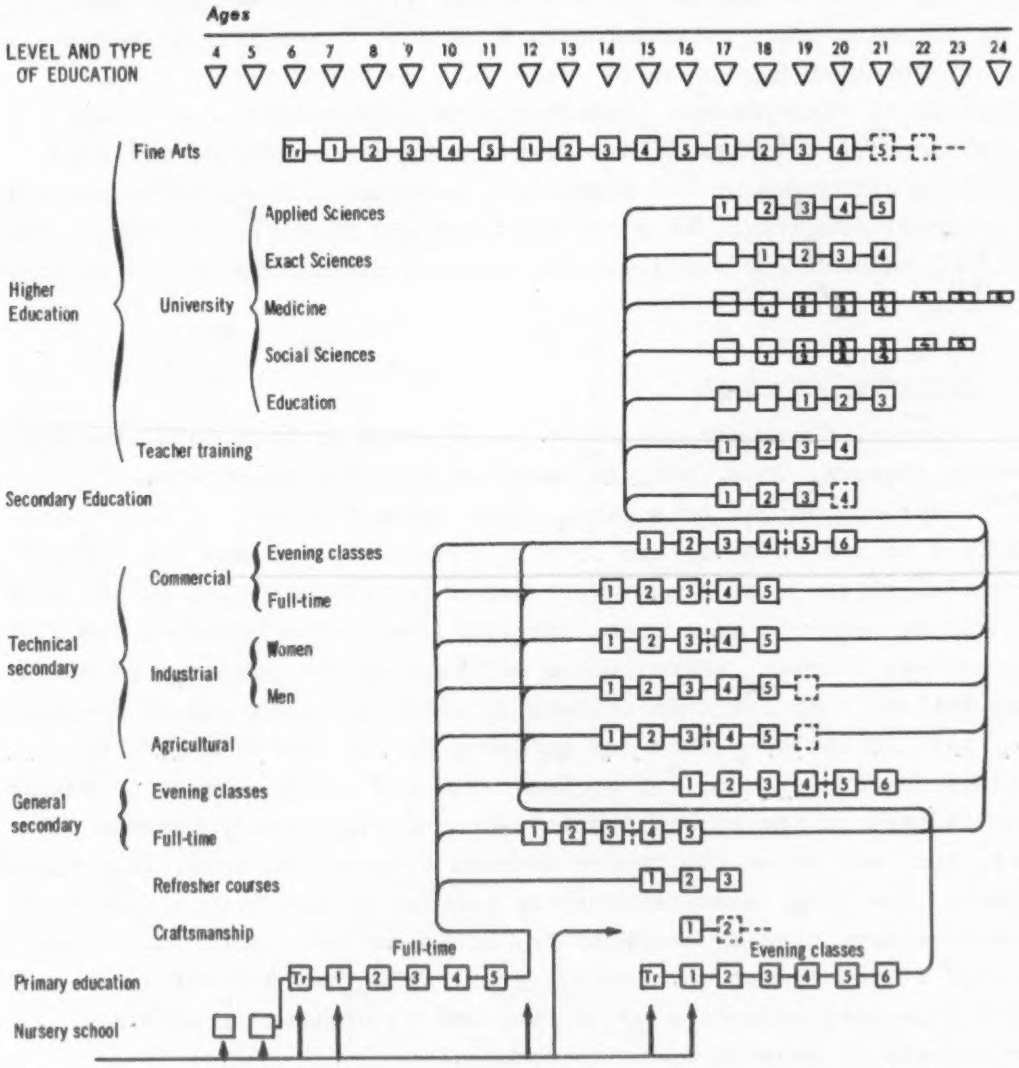
Teachers are civil servants subject to official regulations; their rights and responsibilities are laid down in the "Magisterio Nacional" statutory Act No. 15,215, promulgated on 23rd October, 1964.

C. STRUCTURE OF THE EDUCATIONAL SYSTEM

The national educational system covers primary, secondary and higher education. Pre-primary education is also provided in kindergartens, and elementary technical training in craft centres and workshops, refresher courses or colleges. In addition, industry, the armed forces and the group-leader training centres have developed manpower training programmes: the National Polytechnic School, the School of Electronics, the Higher Institute of Administration and Technology, the School of Technology and the Agricultural Technical School, supply technical training at intermediate level in their respective fields. Finally, the advanced non-university schools, military training colleges, the diplomatic school, para-medical schools, seminaries and art schools all train students in their particular subjects.

Diagram 10

ORGANIGRAM OF THE PERUVIAN EDUCATIONAL SYSTEM


Ages
LEVEL AND TYPE OF EDUCATION
4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Higher Education
Fine Arts
University
Applied Sciences
Exact Sciences
Medicine
Social Sciences
Education
Teacher training
Secondary Education
Technical secondary
Commercial
Evening classes
Full-time
Industrial
Women
Men
Agricultural
General secondary
Evening classes
Full-time
Refresher courses
Craftsmanship
Primary education
Full-time
Evening classes
Nursery school
Tr

(a) Pre-primary and primary education

Between pre-primary education and first year primary education preparatory classes are provided, designed in principle to adapt the child to school life and introduce him to reading, writing and arithmetic. Each school year ends with an examination to decide which pupils shall move on to the next class. A school certificate is awarded upon completion of primary education. In private schools, the final examinations in the fourth and fifth classes are sanctioned by an official board of examiners. A special Commission of the Ministry of Education has power to award full certificates of primary education to "independent students", the self-taught, and to all adults passing the appropriate proficiency examinations. Official curricula are drawn up for pre-school education, transitional classes and primary education; they are balanced and flexible, as befits the national educational requirements, and are compulsory in all private schools.

(b) Secondary education

General secondary education is provided in both full-time and evening classes. This, too, is based on official curricula, of equivalent content in both cases. Each subject taught is the responsibility of one teacher, who is also required to assess the pupils' progress. At the end of the year, pupils who have failed in not more than three subjects move up to the next class. The official schools run holiday courses, where pupils can work at the subjects in which they failed: they are then allowed to enter the next class, provided they fail in not more than one subject. In the fourth and fifth classes in day schools, and in the fifth and sixth classes in evening schools part of the curriculum is taken by all pupils; for the other part, they are given the choice between science and arts. In private schools, the final examinations are handled by an official board of examiners appointed by the Ministry of Education. Certificates are awarded at the end of each school year. No entrance examination is set for general secondary education, and no diploma or general certificate is awarded upon its completion.

In technical education, the theoretical teaching is supplemented by practical work in the workshop. The supervisory system and final examinations are much the same as for general secondary education. There is a basic or "vocational guidance" period for each branch. Pupils specialise in their chosen field only during the last two years, except in industrial training for boys, where they specialize from the beginning. Certificates are awarded at the end of each school year, and a specialised technician's diploma, registred by the Ministry of Education, rewards successful students when the course is completed. In both agricultural and industrial training for boys, the award of the diploma is conditional on the completion of a year's practical experience under supervision.

Teachers are trained in teacher training colleges responsible to the Ministry of Education or attached to the universities. Public teacher training colleges train primary and general and technical secondary school teachers, teachers of physical training and teachers for pre-school education. Private teacher training colleges do not provide training for the last two categories. At the end of the last year, students sit for a final examination to obtain the diploma awarded by the Ministry of Education or the national University, as the case may be; the qualifying teaching diplomas are registered at the Ministry of Education.

(c) Higher education

The examination system, the organisation and length of studies, and methods of supervision differ from one university to the other. In some, the entrance examination is the same for all branches of instruction, in others it varies according to the Faculty chosen; in some subjects, the student can begin to specialize straight away, in others he must first take a prespecialisation course, or one which is common to students in all fields. Teaching is organised on either a subject or "credits" basis, per year or semester, with one or two examinations a year. Students are enrolled according to standard or to subject; switches from one subject to another are governed by certain rules to ensure continuity. In the chart showing the structure of the educational system, the various university courses come under the main groups used for forecasting the development of university education in this report. The average length of the courses is stated.

The ages shown in Graph 10 correspond to the regulation ages for admission and to the number of years in each course for a normal period of study.

BREAKDOWN OF PUBLIC EXPENDITURE ON EDUCATION IN 1965

(in millions of 1960 Soles)

	Ministry of education	National universities	Gross total	Deductions for transfers (b)	Net total
Total	3470.1	765.0	4235.3	- 550.2	3685.0
Current expenditure	3209.3	661.9	3871.3	- 550.2	3321.0
- Direct	2454.6	628.8	3083.5		3083.5
- Salaries	2353.6	452.8	2806.4		2806.4
- Goods	50.8	70.4	121.2		121.2
- Services	50.2 (a)	105.6	155.9		155.9
- Indirect	754.7	33.1	787.7	- 550.2	237.5
Capital expenditure	260.8	103.1	364.0		364.0
- Direct	260.8	90.0	351.0		351.0
- Construction	186.3	76.9	263.3		263.3
- Equipment	68.0	13.1	81.1		81.1
- Buildings	6.5	-	6.6		6.6
- Indirect	-	13.0	13.0		13.0

(a) Including 15,7% of expenditure on rent.

(b) Transfers from the Ministry of Education to the National Universities.

TOTAL DIRECT CURRENT EXPENDITURE PER PUPIL IN STATE EDUCATION FOR 1965

(in 1960 Soles)

	Pupils enrolled		Direct current expenditure					
			Total		Per pupil	Breakdown (%)		
	Absolute figures	%	10^6 S/.	(%)	S/.	Salaries	Goods	Services
Total for the			3321.0	100.0		91.1	3.9	5.1
Administration			155.1	4.8		80.3	2.5	17.2
of the Educational system	2201462	100.0	3137.4	94.5	1425	91.6	3.9	4.5
- Nursery and primary	1811495	82.3	1495.1	45.0	825	99.5	0.1	0.4
- Secondary	330115	15.0	886.0	26.7	2684	94.3	3.8	1.9
- General	260596	11.8	600.3	18.1	2303	94.7	3.5	1.8
- Technical	69519	3.2	285.6	8.6	4108	93.4	4.5	2.1
- Agricultural	9626	0.4	63.6	1.9	6605	89.5	6.6	3.9
- Industrial	30179	1.4	160.0	4.8	5302	93.9	4.2	1.8
- Boys	18537	0.8	99.5	3.0	5370	92.1	5.5	2.4
- Girls	11642	0.5	60.5	1.8	5192	97.0	2.1	0.9
- Commercial	29714	1.3	62.0	1.9	2087	95.9	2.9	1.1
- Higher	59852	2.7	756.5	22.8	12640	72.7	11.8	15.5
- Teacher training (a)	9997	0.5	79.2	2.4	7924	78.7	16.6	4.7
- Universities (b)	49855	2.3	677.3	20.4	13585	72.0	11.2	16.8
- Institutes of education (c)	14244	0.6	121.9	3.7	8686	81.8	8.2	10.0
- Humanities	17296	0.8	180.5	5.4	10423	69.3	9.4	21.3
- Medicine	3600	0.2	93.9	2.8	26057	57.4	17.6	25.0
- Science	4472	0.2	58.4	1.8	13029	69.6	15.2	15.2
- Engineering	10243	0.5	222.7	6.7	21714	75.6	10.6	13.8
Miscellaneous			28.4	0.9		87.5	9.5	3.8

(a) Includes only those teacher training colleges under the Ministry of Education.
(b) The heading "Universities" does not include the Pontifical Catholic University of Peru.
(c) Includes teacher training attached to the Universities.

Annex 3 - 1

PROPOSED SPECIAL PROGRAMME FOR THREE-DIMENSIONAL TABULATION OF THE ACTIVE POPULATION, BASED ON THE RESULTS OF THE SIXTH POPULATION CENSUS, 1961

The final returns of the Sixth Population Census were available for the base year of this study (1961), including most of the tables in the ordinary tabulation programme. However, it was thought that all the original census returns could usefully be recorded on IBM magnetic tape, (109 tapes), to extract fuller information about the active population by selecting a sample and using it to prepare a three-dimensional tabulation based on sector of activity, occupational category and level of education. Such a tabulation proved very useful for the methodology of this report; furthermore, ten original IBM tapes covering the whole active population are now available, and which may obviously facilitate further research.

The tabulation was broken down as follows:

A. Extraction of the following figures for each economically active person from the 109 IBM magnetic tapes of the population census.

(40 x 23 block,
work mark)

(Position of each
item recorded)

1, 2	Province
3	Type of area
4	Sex

5, 6	Age
7, 8, 9	Place of birth
10, 11	Period of residence
12, 13, 14	Level of education
15, 16	Economically active or inactive
17, 18, 19	Chief occupation
20, 21, 22	Sector of economic activity
23	Occupational category
24	Work mark

B. Extraction of a stratified sample and conversion of the original code number to a new, more synthesized system adapted to the programming needs. The stratification of the sample is shown in detail in Annex 3 - II. The conversion of the code numbers for economic sectors is shown in Annex 3 - III - A, that of the code numbers for occupational categories in Annex 3 - III - B, and that of the code numbers for levels of education in Annex 3 - III - C. Four age groups were taken: under 15, 15-24, 25-44, and 45 and over.

C. Tabulation of the figures
For each of the 17 economic sectors, a table in matrix form was issued, covering 48 occupational categories and 28 levels of education, in absolute and relative figures. The tables are further broken down by annex, area (urban or rural) and age (4 groups). The results are summarized in Annex 3 - V (the interpretation of the code numbers can be found in Annex 3 - III).

Annex 3-II

BREAKDOWN OF SAMPLE FROM THE 1961 POPULATION CENSUS BY ECONOMIC SECTOR

	Original code	Total number of workers (in thousands)	Number of workers in the sample	Percentage of the sample
Agriculture	01, 02, 03	1,505.6	30,112	2
Fisheries	04	50.0	10,000	20
Mining industries	1-	66.4	13,280	20
Manufacturing industries	2-, 3-	411.0	82,220	20
Construction (a)	4-	104.7	10,470	10
Power	5-	8.6	8,600	100
Commerce	6-	281.8	28,180	10
Transport	7-	94.0	9,400	10
Services (b)	8-	476.7	95,340	20
Not specified	9-	125.8	12,580	10
	TOTAL	3,124.6	300,182	9.6

(a) Including 5 sub-groups (see Annex 3-III-A)

(b) Including 3 sub-groups (see Annex 3-III-A)

Annex 3-III-A

CLASSIFICATION OF ECONOMIC SECTORS

(compatible with the classification used by the National Institute of Planning)

Economic sector Our code:	International classification (1)
00 = Agriculture (including stockbreeding, forestry, hunting)	01, 02, 03
01 = Fisheries	04
10 = Mining industries	11, 12, 13, 14, 19
20 = Manufacturing food industries (including food products, beverages and tobacco)	20, 21, 22
21 = Textile industries (Including the manufacture of textiles, ready mades and shoes)	23, 24
22 = Chemical industries (Including chemical products, petroleum and coal by-products)	31, 32
23 = Metallurgical industries (Including basic metallurgical industries, manufacture of machines etc.)	34, 35, 36, 37, 38
24 = Other manufacturing industries (Including wood, cork, paper, leather, rubber, ciment and glass)	25, 26, 27, 28, 29 30, 33, 39
30 = Construction (Including housing)	40
40 = Power (Including gas, water, electricity and drainage)	51, 52

(1) International Standard Industrial Classification of all Economic Activities.

50 = Transport, warehousing and communications	71, 72, 73
51 = Commerce	61
52 = Banking, Insurance and immovable goods	62, 63, 64
53 = Public services (Including Public Administration)	81
54 = Education (Including State and private education)	821
55 = Other services	822, 823, 824, 825, 826, 827, 828, 829, 83, 84, 85
90 = Unspecified activities (Including those seeking employment)	90, 99

Annex 3-III-B

CLASSIFICATION OF OCCUPATIONAL CATEGORIES

Occupational categories Our code:	Census classification (1)
0 - Highly qualified Scientific and Technical Personnel	
00 = Agronomists and zoo-technicians	006, 022
01 = Mining engineers	004
02 = Civil engineers, architects	000, 001
03 = Electrical, mechanical and industrial engineers	002, 003, 005
04 = Chemical and metallurgical engineers	007, 010
05 = Physicists, geologists	011
06 = Veterinarians, zoologists, biologists	021, 025
07 = Specialists, physicians and gynaecologists	030, 052, 830
08 = Dentists	031
09 = Pharmacy graduates	012
1 - Non scientific and non technical professions	
10 = University professors	060
11 = General secondary school professors	061
12 = Technical secondary school professors	062
13 = Primary school teachers	063
14 = Nursery school teachers	064
15 = Geographers, historians, sociologists, philosophers, psychologists	073, 074, 075, 076, 077
16 = Mathematicians, actuaries, economists, auditors, accountants	070, 071, 072, 200, 201

(1) International Standard Industrial Classification of all Economic Activities.

17 = Jurists, judges, notaries	080, 081, 082, 083 084, 085
18 = Artists	091, 094

2 - Intermediate personnel

20 = Technicians, non-university agronomists	008, 020, 023, 024
21 = Draughtsmen	009, 0Y3
22 = Technicians, naval and air pilots	00X, 620, 621, 640
23 = Laboratory technicians	013, 014
24 = Nurses, health technicians, midwives	050, 051, 053
25 = Medical technicians	040, 041, 042
26 = Social assistants	0X4, 0Y0
27 = Jurisprudence technicians	086, 087
28 = Decorators, artists	090, 092, 093, 095
29 = Interpreters, archivists and librarians	0Y1, 0Y2, 0Y9, 334

3 - Administrators, directors and agents

30 = Top level of public bodies, of large firms (including owners)	100, 101, 110, 120, 121, 122, 123, 124, 125, 126, 129, 405
31 = Intermediate level (Including owners of small firms)	102, 103, 111, 112, 113, 114, 115, 116, 117, 118, 119, 11X 127, 400, 401, 402, 403, 404, 406, 430
32 = Lower level	130, 131, 132, 133, 134, 139

4 - Office workers

40 = Top level	210, 240, 270
41 = Medium	220, 221
42 = Intermediate	230, 231, 241, 261, 262

43 = Lower	211, 212, 260, 280, 281, 282, 283, 284, XXI
5 - Salesmen	
50 = Wholesalers, owners and commercial agents	300, 320, 321
51 = Wholesalers, owners	301
52 = Commissionners, agents and brokers	313, 322, 330, 331, 332, 333, 335, 336, 337
53 = Retail employees	310
54 = Itinerant salesmen	311, 312, X54
60 - Skilled workers	610, 641, 711, 713, 721, 731, 760, 762, 770, 772, 773, 781, 782, 784, 786, 790, 791, 792, 7Y0, 7Y1, 7Y2, 7Y3, 7Y4, 7Y9, 800, 832, 891, X61, X81, X90
61 - Semi-skilled workers	414, 415, 420, 431, 522, 560, 561, 600, 601, 602, 611, 700, 701, 703, 706, 707, 709, 710, 712, 715, 716, 717, 720, 723, 730, 733, 740, 741, 742, 750, 761, 763, 764, 771, 774, 780, 785, 793, 7X0, 7X2, 7X4, 801, 802, 810, 811, 820, 821, 822, 823, 824, 831, 833, 840, 841, 842, 850, 851, 871, 890, 894, 921, X51, X52, X60, X91, XX0, XY3, XY8, XY9

62 - Family help in agriculture	413
63 - Unskilled labourers	250, 251, 252, 253, 259, 271, 410, 411, 412, 421, 422, 440, 441, 442, 443, 500, 501, 502, 503, 504, 505, 506, 509, 510, 511, 520, 521, 523, 524, 530, 531, 540, 541, 550, 551, 570, 571, 603, 604, 605, 608, 609, 630, 631, 650, 660, 661, 680, 691, 702, 704, 705, 708, 714, 718, 722, 732, 743, 744, 751, 7X1, 7X3, 7X5, 7Y5, 7Y6, 834, 835, 836, 837, 838, 839, 83X, 860, 861, 870, 872, 880, 892, 893, 895, 896, 8X0, 8X1, 8X2, 8Y1, 900, 901, 902, 903, 904, 905, 910, 911, 912, 913, 914, 920, 922, 930, 931, 932, 933, 934, 935, X10, X11, X12, X13, X14, X15, X20, X21, X30, X31, X40, X41, X50, X53, X55, X62, X70, X71, X72, X80, XY0, XY1, XY2, XY4
7 - Unspecified (Including unemployed and those seeking work)	Y00, Y01, Y02, Y03, Y04, Y99
8 - Military, etc.	X00, X01, X02, X03 X04, Y10, Y20
9 - Church	0X0, 0X1, 0X2, 0X3

Annex 3-III-C

CLASSIFICATION OF EDUCATIONAL LEVEL

	Census code	Our code
Illiterates	000	00
Kindergarten	101	00
Preparatory classes	102	10
Primary education - 1st year	111	10
2nd year	112	10
3rd year	113	10
unspecified year	119	10
4th year	114	11
5th year	115	11
6th year	116	11
General secondary education		
1st year	121	20
2nd year	122	20
3rd year	123	20
unspecified year	129	20
4th year	124	21
5th year	125	21
6th year	126	21
Technical secondary education		
1st year	131	30
2nd year	132	30
3rd year	133	30
unspecified year	139	30
4th year	134	31
5th year	135	31
6th year	136	31
Teacher training colleges	141/149	40
University education	-	5-
Sciences - Natural sciences	201/209	50
Economic and commercial science	211/219	51
Law	221/229	51
Education	231/239	52
Pharmacy and biochemistry	241/249	50
Arts	251/259	53

	Census code	Our code
Medicine	261/269	54
Veterinary medicine	271/279	55
Odontology	281/289	54
Chemistry	291/299	50
Engineering training	-	6-
Engineer (not mentioned elsewhere)	301/309	69
Engineer: agronomist	310/319	60
Engineer: architect	321/329	61
Engineer: civil	331/339	61
Egnineer: physicists and mathematicians	341/349	62
Engineer: geologist, naval, aeronautical	351/359	63
Engineer: industrial - textile	361/369	64
Engineer: mechanical - electrical	371/379	65
Engineer: mining	381/389	63
Engineer: petroleum	391/399	63
Engineer: chemistry	401/409	66
Engineer: sanitary	411/419	61
Engineer: urbanist	421/429	61
Obstetricals	431/439	56
Decoration	441/449	59
Journalism	451/459	59
Theologist	461/469	59
Human relations	471/479	59
University education (n.m.e.)	490/499	59
Non-university education	-	7-
Artists	501/509	70
Social workers	511/519	70
Librarian	521/529	70
Commercial training	531/539	70
Physical education	541/549	72
Nurses	551/559	71
Dressmaking and cutting	561/569	70
Languages	571/579	70
Music and singing	581/589	70
Non-university education (n.m.e.)	590/599	70
Unspecified	999	99

Annex 3-IV

BREAKDOWN OF THE ACTIVE POPULATION BY ECONOMIC SECTOR AND LEVEL OF EDUCATION, 1961

(as percentage of sector employment)

Level of education / Economic sectors	No education	Primary	Secondary		Higher				Other education	Not specified	TOTAL
			General	Technical	Teacher training	Humanities	Medicine	Science and technology			
Agriculture	46.77	48.60	1.74	0.15	0.01	0.05		0.11	0.02	2.51	100.00
Fisheries	9.85	77.31	8.81	1.09		0.35		0.43	0.09	2.07	100.00
Mining industries	15.31	67.90	10.72	1.40	0.02	0.79	0.12	2.09	0.35	1.49	100.00
Manufacturing industries	17.79	63.10	15.53	2.07		0.58	0.05	0.61	0.44	1.83	100.00
- Food and beverages	9.97	72.20	11.80	1.81	0.02	0.62	0.05	0.72	0.42	2.39	100.00
- Textiles and ready mades	30.12	56.02	8.94	1.48	0.02	0.21	0.01	0.18	0.40	1.64	100.00
- Chemical products	3.40	56.86	24.31	4.23		2.01	0.59	4.99	0.97	2.61	100.00
- Metallurgy	2.86	69.17	21.44	3.28	0.04	0.39	0.01	0.88	0.48	1.45	100.00
- Other industries	8.24	67.62	17.45	2.53	0.03	1.08	0.08	0.50	0.51	1.95	100.00
Construction	10.05	73.08	9.96	1.06	0.02	0.24		2.03	0.18	3.38	100.00
Power	11.19	55.50	19.94	3.68	0.14	1.36	0.14	2.38	0.87	4.79	100.00
Transport	4.17	67.84	22.19	2.16	0.05	0.55	0.06	0.39	0.60	1.97	100.00
Commerce	11.26	54.96	22.51	3.52	0.05	1.57	0.12	1.15	0.76	4.10	100.00
Banking, Insurance	1.54	19.69	53.50	9.45	0.21	8.29	0.32	3.35	2.23	1.43	100.00
Public services	3.25	47.34	29.80	3.34	0.33	3.37	0.99	1.81	6.87	2.91	100.00
Education	0.48	18.35	36.01	3.66	22.60	12.13	0.74	2.20	2.56	1.27	100.00
Other services	22.85	52.63	9.04	1.27	0.07	2.13	2.18	0.34	1.26	8.23	100.00
Not specified	15.31	50.06	22.01	4.67	0.20	1.36	0.22	1.34	0.94	3.91	100.00
TOTAL	30.06	52.65	9.81	1.36	0.50	0.92	0.27	0.54	0.64	3.13	100.00

Annex 3-V

BREAKDOWN OF THE ACTIVE POPULATION BY OCCUPATIONAL CATEGORY AND LEVEL OF EDUCATION FOR EACH ECONOMIC SECTOR

(as a percentage of the active population in each sector)

ECONOMIC SECTOR : 00

Education-al level	Occupational category													Total	Total (in thousands of persons)
	0	1	2	3	4	5	60	61	62	63	7	8	9		
00				24.50		0.01	0.01	0.08	8.23	13.91	0.01			46.77	717.4
10				18.64	0.02	0.01	0.04	0.54	5.69	11.14	0.02			36.10	553.8
11			0.01	6.18	0.06		0.04	0.43	2.38	3.39				12.50	191.8
20				0.62	0.03			0.03	0.13	0.31				1.11	17.1
21		0.01		0.46	0.04			0.02	0.06	0.05				0.63	9.6
30				0.04	0.01			0.01	0.01	0.02				0.09	1.4
31		0.01	0.01	0.01	0.01			0.01	0.01					0.06	0.9
40				0.01										0.01	0.1
50,55	0.01													0.01	0.2
54,56															
51,53,59				0.05										0.05	0.8
52															
6	0.04		0.01	0.06										0.10	1.7
7				0.02										0.02	0.4
9				1.18	0.01			0.05	0.28	0.98	0.01			2.51	38.5
TOTAL	0.06	0.02	0.04	51.76	0.19	0.02	0.10	1.17	16.81	29.81	0.04			100.00	1,534.0

Annex 3-V

BREAKDOWN OF THE ACTIVE POPULATION BY OCCUPATIONAL CATEGORY AND LEVEL OF EDUCATION FOR EACH ECONOMIC SECTOR

(as a percentage of the active population in each sector)

ECONOMIC SECTOR: 01

Educational level	Occupational category													Total	Total (in thousands of persons)
	0	1	2	3	4	5	60	61	62	63	7	8	9		
00				0.12				9.57		0.17				9.85	2.1
10			0.19	0.12	0.02		0.05	40.35		0.93	0.14			41.80	8.8
11			0.36	0.26	0.09	0.05	0.17	33.56		0.81	0.19	0.02		35.51	7.5
20			0.07	0.05	0.31	0.05	0.07	5.29		0.17	0.02			6.03	1.8
21		0.05	0.12	0.14	0.38		0.05	1.92		0.07	0.05			2.78	0.6
30			0.02		0.09			0.43		0.02				0.57	0.1
31		0.05		0.02	0.17		0.07	0.19		0.02				0.52	0.1
40															
50,55															
54,56															
51,53,59		0.12		0.12	0.07			0.04						0.35	0.1
52															
6	0.12		0.07	0.12	0.02	0.02		0.07						0.43	0.1
7			0.05	0.02				0.02						0.09	
9			0.02	0.02				1.92		0.07	0.02			2.07	0.4
TOTAL	0.12	0.21	0.90	1.00	1.16	0.12	0.40	93.38		2.25	0.43	0.02		100.00	21.1

Annex 3-V

BREAKDOWN OF THE ACTIVE POPULATION BY OCCUPATIONAL CATEGORY AND LEVEL OF EDUCATION FOR EACH ECONOMIC SECTOR

(as a percentage of the active population in each sector)

ECONOMIC SECTOR: 10

Educational level	Occupational category													Total	Total (in thousands of persons)
	0	1	2	3	4	5	60	61	62	63	7	8	9		
00	0.06		0.03	0.23	0.05	0.02	0.24	1.44		12.88	0.17			15.13	10.0
10	0.01	0.02	0.19	1.06	0.54	0.07	1.90	6.19		25.55	0.45	0.02		36.00	23.9
11	0.04	0.04	0.37	1.26	2.07	0.14	3.05	6.76		17.72	0.40	0.05		31.90	21.2
20	0.02	0.03	0.20	0.52	1.00	0.06	0.87	1.20		2.60	0.12	0.01		6.64	4.4
21	0.01	0.11	0.27	0.62	1.38	0.12	0.21	0.39		0.87	0.11			4.08	2.7
30	0.01	0.02	0.02	0.04	0.18	0.02	0.07	0.05		0.14				0.53	0.4
31		0.17	0.05	0.07	0.35		0.08	0.07		0.08	0.02			0.87	0.6
40	0.01	0.01			0.01									0.02	
50,55	0.09			0.04	0.02	0.01								0.15	0.1
54,56	0.08		0.03		0.02			0.01						0.12	0.1
51,53,59	0.02	0.23	0.03	0.23	0.17	0.02	0.03	0.01		0.04				0.76	0.5
52		0.01			0.02									0.03	
6	1.04	0.01	0.05	0.62	0.07	0.11	0.02	0.01		0.02	0.01			1.94	1.3
7	0.02	0.02	0.04	0.08	0.11		0.01	0.03		0.02	0.02			0.35	0.2
9	0.01	0.01	0.03	0.07	0.04	0.01	0.07	0.26		0.94	0.06			1.49	1.0
TOTAL	1.39	0.65	1.29	4.83	6.03	0.57	6.53	16.42		60.86	1.36	0.08		100.00	66.3

Annex 3-V

BREAKDOWN OF THE ACTIVE POPULATION BY OCCUPATIONAL CATEGORY AND LEVEL OF EDUCATION FOR EACH ECONOMIC SECTOR

(as a percentage of the active population in each sector)

ECONOMIC SECTOR: 20

Educational level	Occupational category													Total	Total (in thousands of persons)
	0	1	2	3	4	5	60	61	62	63	7	8	9		
00			0.02	0.10	0.04	0.21	0.36	6.07		1.96	1.21			9.97	5.2
10	0.03		0.06	0.58	0.43	0.95	1.80	22.55		8.04	0.98			35.42	18.5
11	0.01	0.02	0.20	1.38	1.56	1.28	1.99	20.87		8.30	1.16	0.01		36.78	19.2
20		0.03	0.02	0.45	1.02	0.34	0.31	2.95		1.12	0.22			6.50	3.4
21		0.13	0.03	1.21	1.76	0.56	0.19	0.89		0.34	0.18			5.30	2.8
30		0.01		0.10	0.28	0.10	0.06	0.29		0.14	0.02			0.99	0.5
31		0.21	0.01	0.06	0.31	0.01	0.03	0.18		0.01	0.01			0.82	0.4
40					0.02									0.02	
50,55	0.02			0.03	0.03						0.01			0.09	
54,56				0.02	0.02	0.01								0.05	
51, 53,59	0.01	0.15		0.22	0.13	0.04		0.02					0.01	0.58	0.3
52					0.02	0.01		0.01						0.04	
6	0.26	0.01		0.22	0.09	0.03	0.01			0.02				0.63	0.3
7		0.02	0.01	0.08	0.15	0.02	0.04	0.05		0.04	0.01	0.01		0.42	0.2
9				0.12	0.06	0.10	0.12	1.12		0.77	0.10			2.39	1.2
TOTAL	0.33	0.58	0.34	4.56	5.91	3.64	4.92	55.01		20.79	3.89	0.02	0.01	100.00	52.2

Annex 3-V

BREAKDOWN OF THE ACTIVE POPULATION BY OCCUPATIONAL CATEGORY AND LEVEL OF EDUCATION FOR EACH ECONOMIC SECTOR

(as a percentage of the active population in each sector)

ECONOMIC SECTOR: 21

Educa-tional level	Occupational category													Total	Total (in thousands of persons)
	0	1	2	3	4	5	60	61	62	63	7	8	9		
00				0.02		0.02	1.16	5.52	0.01	23.40				30.12	57.8
10				0.04	0.05	0.04	6.03	10.11		6.25	0.06			22.60	43.3
11		0.02	0.02	0.17	0.26	0.10	9.86	18.94		4.90	0.16			34.42	66.0
20		0.01	0.02	0.14	0.28	0.07	1.48	3.48		0.75	0.04			6.27	12.0
21		0.04	0.01	0.33	0.38	0.08	0.46	1.12		0.23	0.01			2.67	5.1
30		0.01	0.01	0.03	0.10	0.02	0.18	0.58		0.19	0.01			1.11	2.1
31		0.04		0.02	0.10		0.03	0.10		0.04	0.01			0.36	0.7
40								0.01						0.02	
50,55														0.01	
54,56								0.01						0.01	
51,53,59		0.04		0.05	0.06	0.01	0.03	0.03		0.01				0.21	0.4
52															
6	0.06			0.06	0.01	0.01		0.02						0.17	0.3
7		0.01		0.03	0.05		0.09	0.15		0.04	0.01			0.40	0.8
9				0.01	0.02	0.01	0.32	0.75		0.53				1.64	3.2
TOTAL	0.06	0.17	0.06	0.89	1.30	0.36	19.63	40.84	0.01	36.37	0.30			100.00	191.8

Annex 3-V

BREAKDOWN OF THE ACTIVE POPULATION BY OCCUPATIONAL CATEGORY AND LEVEL OF EDUCATION
FOR EACH ECONOMIC SECTOR

(as a percentage of the active population in each sector)

ECONOMIC SECTOR: 22

Educa-tional level	Occupational category													Total	Total (in thousands persons)
	0	1	2	3	4	5	60	61	62	63	7	8	9		
00				0.03		0.03	0.17	2.05		1.11				3.40	0.5
10	0.07	0.07	0.59	0.07	0.63	0.17	1.08	12.99		6.84	0.87			23.38	3.4
11		0.07	2.15	0.90	2.47	0.66	1.25	13.96		10.25	1.74	0.03		33.48	4.8
20	0.03	0.07	1.08	0.56	2.12	1.01	0.45	3.61		1.56	0.38			10.87	1.6
21	0.10	0.28	1.46	1.81	4.69	2.85	0.10	1.18		0.59	0.38			13.44	1.9
30		0.10	0.28	0.03	0.49	0.07	0.14	0.52		0.28	0.10			2.01	0.3
31		0.21	0.07	0.17	1.04	0.17	0.14	0.21		0.07	0.14			2.22	0.3
40															
50,55	1.49	0.03	0.35	0.35	0.10	0.45				0.03	0.03			2.84	0.4
54,56	0.07		0.17	0.10	0.03	0.21								0.59	0.1
51,53,59		0.55	0.03	0.31	0.52	0.38				0.03	0.09			1.94	0.3
52			0.03	0.03										0.07	
6	1.11		0.07	0.66	0.07	0.14				0.03	0.07			2.15	0.3
7		0.07	0.17	0.07	0.35	0.24				0.07				0.97	0.1
9			0.14	0.14	0.17	0.03	0.17	0.90		0.83	0.21			2.61	0.4
TOTAL	2.88	1.46	6.60	5.24	12.68	6.43	3.51	35.43		21.71	4.03	0.03		100.00	14.4

Annex 3-V

BREAKDOWN OF THE ACTIVE POPULATION BY OCCUPATIONAL CATEGORY AND LEVEL OF EDUCATION FOR EACH ECONOMIC SECTOR

(as a percentage of the active population in each sector)

ECONOMIC SECTOR: 23

Educa-tional level	Occupational category													Total	Total (in thousands of persons)
	0	1	2	3	4	5	60	61	62	63	7	8	9		
00				0.03			0.74	1.74		0.32	0.04			2.86	1.6
10		0.01		0.13	0.08	0.04	3.81	12.40		3.00	0.20			19.67	11.0
11	0.01	0.02	0.08	0.46	0.58	0.05	7.94	34.08		5.86	0.39	0.02		49.50	27.6
20		0.01	0.04	0.22	0.40	0.04	2.64	9.96		1.29	0.15			14.77	8.2
21	0.02	0.04	0.02	0.45	0.65	0.10	1.26	3.72		0.34	0.08			6.67	3.7
30		0.01		0.02	0.08	0.01	0.35	0.97		0.12	0.02			1.57	0.9
31		0.07		0.09	0.15	0.01	0.39	0.95		0.03	0.02			1.71	1.0
40							0.01	0.03						0.04	
50,55	0.01			0.02	0.02		0.01	0.02		0.01				0.08	
54,56				0.01										0.01	
51,53,59		0.06		0.15	0.06		0.05	0.08						0.38	0.2
52								0.01						0.01	
6	0.34	0.01	0.01	0.22	0.04	0.02	0.04	0.09		0.02	0.02			0.80	0.4
7		0.02		0.01	0.06		0.16	0.20		0.01	0.02			0.48	0.3
9			0.01	0.03	0.02		0.27	0.90		0.20	0.04			1.45	0.8
TOTAL	0.38	0.24	0.15	1.83	2.14	0.28	17.66	65.15		11.19	0.97	0.02		100.00	55.7

Annex 3-V

BREAKDOWN OF THE ACTIVE POPULATION BY OCCUPATIONAL CATEGORY AND LEVEL OF EDUCATION FOR EACH ECONOMIC SECTOR

(as a percentage of the active population in each sector)

ECONOMIC SECTOR: 24

Educa-tional level	Occupational category													Total	Total (in thousands of persons)
	0	1	2	3	4	5	60	61	62	63	7	8	9		
00				0.03	0.01	0.18	0.10	6.34		1.55	0.04			8.24	8.0
10		0.01	0.05	0.21	0.09	0.08	1.91	18.73		5.12	0.42	0.01		26.62	25.8
11	0.01	0.01	0.13	0.66	0.67	0.23	7.85	24.66		6.13	0.63	0.01	0.01	41.00	39.7
20		0.02	0.12	0.45	0.82	0.21	3.36	4.60		1.42	0.17	0.01		11.17	10.8
21		0.07	0.35	0.98	1.25	0.34	1.15	1.61		0.41	0.14			6.28	6.1
30		0.01	0.02	0.07	0.29	0.04	0.44	0.53		0.13	0.04			1.56	1.5
31		0.13	0.01	0.11	0.21	0.01	0.20	0.25		0.03	0.03			0.97	0.9
40		0.02		0.01			0.01							0.03	
50,55	0.01	0.01	0.02	0.01	0.03	0.02	0.02							0.09	0.1
54,56	0.01		0.03	0.01	0.02	0.01	0.01			0.01				0.08	0.1
51,53,59	0.01	0.13	0.43	0.24	0.12	0.05	0.06	0.01			0.03			1.04	1.0
52			0.01	0.02	0.01	0.01								0.04	
6	0.10	0.01	0.02	0.18	0.06	0.02	0.02	0.04			0.02			0.44	0.4
7		0.01	0.04	0.05	0.15	0.01	0.07	0.12		0.06	0.01			0.51	0.5
9		0.02	0.01	0.05	0.05	0.02	0.16	1.20		0.39	0.06			1.95	1.9
TOTAL	0.13	0.45	1.22	3.06	3.75	1.21	15.33	58.08		15.23	1.55	0.03	0.01	100.00	96.8

Annex 3-V

BREAKDOWN OF THE ACTIVE POPULATION BY OCCUPATIONAL CATEGORY AND LEVEL OF EDUCATION
FOR EACH ECONOMIC SECTOR

(as a percentage of the active population in each sector)

ECONOMIC SECTOR: 30

Educational level	Occupational category													Total	Total (in thousands of persons)
	0	1	2	3	4	5	60	61	62	63	7	8	9		
00				0.05			0.10	6.59		3.32	0.01			10.05	10.5
10	0.01		0.02	0.24	0.04	0.03	1.25	25.05	0.01	8.15	0.06			34.86	36.5
11			0.12	0.64	0.15	0.01	2.69	28.88		5.56	0.16			38.22	40.0
20		0.01	0.10	0.32	0.28		0.80	4.41		0.89	0.08			6.88	7.2
21	0.02	0.02	0.13	0.40	0.43	0.01	0.52	1.24		0.27	0.04			3.08	3.2
30			0.03	0.06	0.08		0.12	0.32		0.05				0.65	0.7
31		0.04	0.02	0.04	0.09		0.11	0.11		0.01				0.41	0.4
40								0.01		0.01				0.02	
50,55															
54,56															
51,53,59	0.01	0.04	0.01	0.05	0.05	0.01	0.01	0.02		0.02	0.01			0.23	0.2
52	0.01													0.01	
6	1.59		0.06	0.27	0.01			0.10			0.01			2.03	2.1
7	0.02	0.01	0.03	0.03	0.01		0.04	0.04			0.01			0.18	0.2
9		0.01		0.01	0.01		0.09	2.04		1.21	0.01			3.38	3.5
TOTAL	1.65	0.12	0.52	2.09	1.14	0.06	5.73	68.81	0.01	19.48	0.38			100.00	104.7

Annex 3-V

BREAKDOWN OF THE ACTIVE POPULATION BY OCCUPATIONAL CATEGORY AND LEVEL OF EDUCATION FOR EACH ECONOMIC SECTOR

(as a percentage of the active population in each sector)

Educational level	Occupational category													Total	Total (in thousand of persons)
	0	1	2	3	4	5	60	61	62	63	7	8	9		
00			0.01	0.34	0.06	0.06	0.61	0.34		9.50	0.28			11.19	1.0
10	0.01		0.06	0.34	0.68	0.22	5.13	2.86		16.04	0.89			26.21	2.2
11	0.01	0.05	0.13	0.78	2.30	0.12	10.02	5.89		8.90	1.06	0.02		29.28	2.5
20		0.13	0.14	0.61	2.30	0.05	3.11	1.39		1.28	0.29	0.01		9.30	0.8
21		0.28	0.14	1.55	5.77	0.15	1.68	0.48		0.40	0.17			10.64	0.9
30		0.09	0.05	0.09	0.47	0.01	0.43	0.02		0.09	0.05			1.31	0.1
31		0.30	0.02	0.26	0.64		0.93	0.10		0.05	0.06			2.37	0.2
40		0.06		0.05						0.03				0.14	
50,55	0.02			0.05	0.10									0.17	
54,56	0.03			0.02	0.07						0.01			0.14	
51,53,59	0.01	0.31	0.01	0.25	0.56	0.02	0.09	0.03		0.01	0.03			1.34	0.1
52				0.01	0.01									0.02	
6	0.91		0.05	0.84	0.24		0.13				0.03			2.21	0.2
7	0.02	0.08	0.02	0.14	0.36		0.17	0.02		0.03	0.01			0.87	0.1
9		0.01	0.01	0.14	0.16	0.02	0.58	0.17		3.51	0.17			4.79	0.4
TOTAL	1.03	1.32	0.64	5.47	13.74	0.65	22.90	11.31		39.85	3.07	0.03		100.00	8.6

BREAKDOWN OF THE ACTIVE POPULATION BY OCCUPATIONAL CATEGORY AND LEVEL OF EDUCATION FOR EACH ECONOMIC SECTOR

(as a percentage of the active population in each sector)

ECONOMIC SECTOR: 50

Educa-tional level	Occupational category													Total	Total (in thousands of persons)
	0	1	2	3	4	5	60	61	62	63	7	8	9		
00			0.02	0.01	0.07			0.32		3.68	0.06			4.17	3.9
10			0.13	0.15	0.63		0.34	9.20	0.01	12.20	0.22	0.02		22.90	21.5
11			0.30	0.61	3.55	0.07	0.96	25.62	0.01	13.26	0.53	0.03		44.94	42.2
20		0.01	0.15	0.61	2.86	0.04	0.28	7.32		2.74	0.14	0.02		14.16	13.3
21	0.02	0.14	0.29	0.81	2.42	0.05	0.26	3.02		0.91	0.12			8.03	7.5
30		0.02		0.01	0.53		0.04	0.50		0.23	0.02			1.36	1.3
31		0.10	0.01	0.04	0.22	0.02	0.06	0.27		0.04	0.03			0.80	0.7
40					0.03			0.01		0.01				0.05	
50,55		0.01		0.01	0.02	0.01		0.01						0.06	0.1
54,56	0.01			0.01	0.01			0.02		0.01				0.06	0.1
51,53,59		0.13	0.04	0.10	0.15	0.01		0.08		0.01	0.02			0.55	0.5
52															
6	0.11		0.05	0.05	0.03	0.02	0.02	0.03			0.01			0.33	0.3
7		0.02	0.09	0.03	0.17	0.03	0.01	0.17		0.04	0.03			0.60	0.6
9	0.01	0.01	0.18	0.04	0.17		0.03	0.69		0.82	0.01			1.97	1.8
TOTAL	0.15	0.44	1.26	2.49	10.87	0.27	2.00	47.27	0.02	33.96	1.20	0.07		100.00	93.9

Annex 3-V

BREAKDOWN OF THE ACTIVE POPULATION BY OCCUPATION CATEGORY AND LEVEL OF EDUCATION FOR EACH ECONOMIC SECTOR

(as a percentage of the active population in each sector)

ECONOMIC SECTOR: 51

Educa-tional level	Occupational category													Total	Total (in thousand of person)
	0	1	2	3	4	5	60	61	62	63	7	8	9		
00				0.02	0.01	10.98		0.05		0.18	0.02			11.26	29.6
10		0.01	0.01	0.14	0.17	22.08	0.02	0.22		0.81	0.12			23.59	62.0
11	0.01	0.01	0.05	0.52	1.22	27.53	0.22	0.60		0.98	0.24	0.01		31.37	82.5
20		0.02	0.05	0.43	1.51	8.25	0.07	0.20		0.21	0.08			10.83	28.5
21		0.23	0.04	1.26	2.69	7.15	0.05	0.08		0.08	0.10			11.68	30.7
30		0.07		0.08	0.64	1.02	0.02	0.02		0.03	0.02			1.89	5.0
31		0.26		0.16	0.62	0.54	0.02	0.02		0.01	0.01			1.63	4.3
40						0.05								0.05	0.1
50,55	0.30	0.01	0.02	0.08	0.02	0.13								0.57	1.5
54,56				0.03	0.01	0.08								0.12	0.3
51,53,59		0.29		0.35	0.34	0.50	0.01				0.01			1.53	3.2
52					0.02	0.02								0.04	0.1
6	0.06	0.01	0.01	0.15	0.05	0.26					0.02			0.58	1.5
7		0.06		0.06	0.32	0.27		0.02		0.01	0.01			0.76	2.0
9				0.06	0.12	3.69	0.02	0.05		0.12	0.04			4.10	10.8
TOTAL	0.38	0.97	0.18	3.35	7.74	82.56	0.43	1.27		2.43	0.67	0.01		100.00	263.0

Annex 3-V

BREAKDOWN OF THE ACTIVE POPULATION BY OCCUPATIONAL CATEGORY AND LEVEL OF EDUCATION FOR EACH ECONOMIC SECTOR

(as a percentage of the active population in each sector)

ECONOMIC SECTOR: 52

Educational level	Occupational category													Total	Total (in thousands of persons)
	0	1	2	3	4	5	60	61	62	63	7	8	9		
00								0.05		1.49				1.54	0.3
10				0.11	0.42	0.16		0.37		4.62	0.05			5.73	1.1
11		0.05	0.11	0.64	4.41	0.64	0.27	0.85		6.69	0.27	0.05		13.96	2.6
20		0.05	0.05	0.80	5.84	0.69	0.11	0.21		1.80				9.55	1.8
21		1.11	0.05	5.57	33.17	2.76	0.16	0.11		0.53	0.42	0.05		43.95	8.3
30		0.16		0.21	2.18	0.32				0.16	0.05			3.08	0.6
31		1.49		0.37	3.87	0.48	0.05	0.05			0.05			6.37	1.2
40				0.05	0.16									0.21	
50,55		0.05		0.16	0.27									0.48	0.1
54,56				0.11	0.21									0.32	0.1
51,53,59		1.43	0.10	1.27	4.24	0.95		0.05		0.05	0.05			8.18	1.5
52					0.11									0.11	
6	0.85	0.05		0.74	0.85	0.32		0.05						2.87	0.5
7		0.21		0.37	1.33	0.27				0.05				2.23	0.4
9				0.16	0.37	0.16		0.05		0.69				1.43	0.3
TOTAL	0.85	4.62	0.32	10.56	57.43	6.74	0.58	1.80		16.08	0.90	0.11		100.00	18.8

Annex 3-V

BREAKDOWN OF THE ACTIVE POPULATION BY OCCUPATIONAL CATEGORY AND LEVEL OF EDUCATION FOR EACH ECONOMIC SECTOR

(as a percentage of the active population in each sector)

ECONOMIC SECTOR: 53

Educa-tional level	Occupational category													Total	Total (in thousands of persons)
	0	1	2	3	4	5	60	61	62	63	7	8	9		
00					0.03		0.01	0.07		0.38	2.73	0.02		3.25	3.7
10		0.10	0.06	0.11	0.64	0.01	0.13	1.03		1.78	10.95	0.06		15.76	18.2
11	0.01	0.22	0.47	0.46	3.77	0.03	0.42	2.46		2.20	12.87	8.66	0.01	31.58	36.5
20		0.09	0.41	0.49	3.70	0.04	0.21	0.77		0.58	3.77	4.64		14.70	17.0
21	0.01	0.42	0.61	1.47	6.82	0.11	0.19	0.27		0.26	1.60	3.32		15.10	17.5
30		0.05	0.06	0.10	0.77		0.05	0.08		0.05	0.33	0.19		1.67	1.9
31		0.26	0.05	0.11	0.81		0.05	0.07		0.01	0.22	0.08		1.67	1.9
40		0.17		0.07	0.06			0.01			0.01	0.02		0.33	0.4
50,55	0.16	0.02	0.03	0.04	0.06						0.02	0.02		0.40	0.5
54,56	0.71	0.03	0.02	0.06	0.11						0.02	0.03		0.99	1.1
51,53,59	0.02	1.15	0.12	0.40	0.82	0.01		0.02		0.01	0.25	0.31	0.02	3.15	3.6
52		0.10	0.01	0.02	0.06							0.02		0.22	0.3
6	0.73	0.03	0.05	0.32	0.13	0.01					0.07	0.04		1.41	1.6
7	0.01	0.08	0.20	0.07	0.47	0.01	0.05	0.01		0.11	4.21	1.66		6.87	2.9
9	0.02	0.02	0.03	0.04	0.18		0.01	0.10		0.22	1.96	0.32		2.91	3.4
TOTAL	1.68	2.72	2.12	3.79	18.44	0.24	1.13	4.91		5.61	39.02	20.30	0.03	100.00	115.6

Annex 3-V

BREAKDOWN OF THE ACTIVE POPULATION BY OCCUPATIONAL CATEGORY AND LEVEL OF EDUCATION FOR EACH ECONOMIC SECTOR

(as a percentage of the active population in each sector)

ECONOMIC SECTOR: 54

Educational level	Occupational category														
	0	1	2	3	4	5	60	61	62	63	7	8	9	Total	Total (in thousands of persons)
00		0.09		0.01	0.01			0.07		0.30				0.48	0.3
10	0.01	0.80	0.04	0.02	0.14		0.05	0.63		1.72	0.06	0.01		3.47	2.3
11		9.49	0.11	0.14	1.37	0.01	0.08	0.91		2.60	0.14	0.01	0.02	14.88	9.8
20	0.01	10.58	0.17	0.07	1.28	0.02	0.05	0.20		0.42	0.06	0.04	0.01	12.90	8.5
21		19.32	0.17	0.18	2.89		0.09	0.13		0.18	0.12	0.02		23.11	15.2
30		1.01	0.02	0.01	0.36		0.02	0.03		0.04				1.48	1.0
31		1.74	0.03	0.08	0.33		0.02	0.02		0.02				2.18	1.4
40	0.01	22.27	0.01	0.08	0.16		0.02			0.05	0.01			22.60	14.9
50,55	0.03	0.75	0.01	0.02	0.08		0.02	0.01			0.01			0.91	0.6
54,56	0.16	0.49	0.02	0.02	0.05		0.01				0.01			0.74	0.5
51,53,59	0.02	5.26	0.15	0.06	0.41		0.04	0.02		0.04	0.03		0.06	6.05	4.0
52	0.01	5.86	0.03	0.05	0.09		0.02			0.03				6.08	4.0
6	0.07	1.12	0.01	0.02	0.06		0.01	0.01						1.29	0.8
7		1.44	0.23	0.05	0.18	0.01	0.58	0.01		0.01	0.04	0.02	0.01	2.56	1.7
9		0.98	0.03	0.02	0.06	0.01		0.03		0.13	0.02			1.27	0.8
TOTAL	0.30	81.20	1.02	0.75	7.48	0.05	0.98	2.05		5.53	0.48	0.09	0.10	100.00	65.9

Annex 3-V

BREAKDOWN OF THE ACTIVE POPULATION BY OCCUPATIONAL CATEGORY AND LEVEL OF EDUCATION FOR EACH ECONOMIC SECTOR

(as a percentage of the active population in each sector)

ECONOMIC SECTOR: 55

Educa-tional level	Occupational category													Total	Total (in thousands of persons)
	0	1	2	3	4	5	60	61	62	63	7	8	9		
00		0.08	0.02	0.08	0.01	0.69	0.01	0.44		21.48	0.03	0.01		22.85	67.4
10	0.01	0.31	0.31	0.33	0.18	0.48	0.23	2.11		26.45	0.11	0.01	0.02	30.55	90.1
11	0.01	0.54	1.47	0.83	1.02	0.49	0.93	2.98		13.47	0.27	0.04	0.03	22.08	65.2
20	0.01	0.13	0.85	0.37	0.78	0.13	0.40	0.56		1.55	0.10	0.01	0.02	4.90	14.5
21	0.02	0.27	0.93	0.52	1.20	0.14	0.28	0.22		0.40	0.07	0.01	0.07	4.14	12.2
30		0.03	0.10	0.04	0.25	0.03	0.06	0.05		0.16	0.01			0.73	2.2
31		0.12	0.05	0.04	0.23	0.01	0.02	0.02		0.04				0.54	1.6
40		0.04			0.01			0.01					0.01	0.07	0.2
50,55	0.08	0.01	0.03	0.01	0.01	0.01								0.15	0.4
54,56	2.02	0.01	0.04	0.05	0.03	0.01	0.01	0.01		0.01				2.18	6.5
51,53,59	0.02	1.16	0.14	0.11	0.20	0.02	0.01	0.01		0.01	0.02		0.41	2.10	6.2
52		0.01	0.01		0.01									0.03	0.1
6	0.07	0.01	0.02	0.05	0.02	0.01					0.01			0.19	0.6
7		0.04	0.81	0.06	0.16	0.02	0.02	0.02		0.11	0.01		0.01	1.26	3.7
9	0.02	0.03	0.07	0.08	0.05	0.12	0.03	0.27		7.52	0.03		0.01	8.23	24.3
TOTAL	2.27	2.78	4.85	2.57	4.15	2.16	2.02	6.68		71.21	0.65	0.07	0.58	100.00	295.1

Annex 3-V

BREAKDOWN OF THE ACTIVE POPULATION BY OCCUPATIONAL CATEGORY AND LEVEL OF EDUCATION FOR EACH ECONOMIC SECTOR

(as a percentage of the active population in each sector)

ECONOMIC SECTOR: 90

Educational level	Occupational category													Total	Total (in thousands of persons)
	0	1	2	3	4	5	60	61	62	63	7	8	9		
00	0.07		0.03	0.20	0.12	0.01	0.01	0.09		0.50	14.27	0.02		15.31	18.8
10	0.02	0.01	0.04	0.15	0.62	0.03	0.15	0.63	0.02	1.59	17.32	0.02		20.59	25.3
11	0.03	0.06	0.05	0.33	2.47	0.12	0.36	1.62		2.85	21.48	0.11		29.47	36.2
20		0.04	0.07	0.28	2.27	0.07	0.23	0.50		0.59	5.72	0.05		9.82	12.1
21		0.21	0.07	0.45	3.76	0.16	0.05	0.16		0.19	7.11	0.04		12.19	15.0
30		0.02	0.01	0.04	0.89	0.01	0.03	0.05		0.11	1.28			2.45	3.0
31		0.20	0.03	0.04	0.72	0.01	0.02	0.07		0.02	1.10	0.01		2.22	2.7
40		0.02		0.07	0.01						0.10			0.20	0.2
50,55	0.04	0.01		0.04	0.05	0.01					0.14			0.30	0.4
54,56	0.02	0.01	0.01		0.05	0.01					0.12			0.22	0.3
51,53,59		0.23	0.02	0.18	0.44	0.03				0.01	0.42			1.32	1.6
52					0.01						0.03			0.04	
6	0.39	0.01	0.02	0.08	0.10	0.03		0.02			0.40			1.04	1.3
7		0.08	0.06	0.01	0.33	0.01	0.02	0.01		0.02	0.39	0.01		0.94	1.2
9		0.04	0.01	0.07	0.23	0.01	0.01	0.11		0.32	3.11	0.02		3.91	4.8
TOTAL	0.58	0.92	0.40	1.96	12.05	0.50	0.88	3.27	0.02	6.19	72.99	0.26		100.00	123.0

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